TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

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SLEEPING SICKNESS.

GREGGIO (G.). **Quelques observations sur la durée moyenne de vie des trypanosés en traitement.**—*Bull. Soc. Path. Exot.* 1917. Oct. Vol. 10. No. 8. pp. 719–723.

The object of the work referred to in this paper was to ascertain the average length of life of patients infected with trypanosomes who submitted to treatment. The observations were made on natives in the hospital at Kisantu (Belgian Congo) and were undertaken during the period 1907–1915. Diagnosis was made by gland puncture except in those cases in which somnolence was present. The treatment administered is recorded in a previous paper [see this *Bulletin*, Vol. 7, p. 103]. The total number of patients treated was 425; of 205 males 84 (40·9 per cent.) and of 220 females 75 (34 per cent.) were alive at the end of 1915.

Details are given in the following table:—

		Etat des malades fin 1915.	
		En vie.	Décédés.
Malades soignés en 1907	51	20 soit 39·0 %	31 soit 60·7 %
,, 1908	36	16 ,, 44·4 %	20 ,, 55·5 %
,, 1909	29	10 ,, 34·4 %	19 ,, 65·5 %
,, 1910	39	12 ,, 30·7 %	27 ,, 69·0 %
,, 1911	90	38 ,, 42·2 %	52 ,, 57·7 %
,, ,, 1912	51	17 ,, 33·3 %	34 ,, 66·6 %
,, ,, 1913	79	29 ,, 36·7 %	50 ,, 63·2 %
,, ,, 1914	50	16 ,, 32·0 %	34 ,, 68·0 %

During the earlier years, 1907–1911, the cases were drawn for the most part from the personnel of the mission and hence were recognised in the early stages of the disease; later the examinations were extended to neighbouring regions and consequently the cases were not so quickly recognised nor were they so amenable to treatment. Many of the latter left hospital after the first few injections and returned to their ordinary life. For this reason the author was able to ascertain the

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exact date of death in only 183 cases. The length of life in these cases is given in the following table :—

2 malades ont survécu	7 ans	½
3 ,, ,, ,,	5 ,,	½
3 ,, ,, ,,	4 ,,	½
1 malade a survécu	4 ,,	
8 malades ont survécu	3 ,,	½
5 ,, ,, ,,	3 ,,	
4 ,, ,, ,,	2 ,,	½
12 ,, , ,,	2 ,,	
21 ,, ,, ,,	1 ,,	½
13 ,, ,, ,,	1 ,,	
39 ,, ,, ,,	6 à	11 mois
40 ,, ,, ,,	3 ,,	6 ,,
22 ,, ,, ,,	1 ,,	2 ,,
10 ,, ,, ,,	quelques jours	

These figures show that treatment of infected cases in hospital has little advantage over the ambulatory treatment ; probably the results are equal. The season of the year had no relation to the number of deaths. The author was unable to establish any relationship between the quantity of arsenic administered to the patients, and their condition in 1915. Some patients who received 80 to 150 injections were dead in 1915, whilst others who had many fewer injections, sometimes only one or two, did well. There is however no doubt that treatment prolongs life ; thus of 59 patients found (on a tour) to be infected in 1911, 26 were treated and 16 (61·5 per cent.) of them were alive in February 1916, whilst of the 33 who were not treated only 9 (27·2 per cent.) were alive on the latter date.

In conclusion the author states that the average duration of life of natives infected with trypanosomes is short and that, if treatment prolongs life, neither the number of injections nor augmentation of weight which often occurs, furnishes a certain indication of the ultimate fate of the patient.

W. Yorke.

MACFIE (J. W. Scott). **A Monomorphic Trypanosome of Man.**—*Report of the Accra Laboratory for the Year 1916.* 1917. London: J. & A. Churchill. pp. 60–66. With 1 chart.

The substance of this important article has already appeared and has been summarised [see this *Bulletin*, Vol. 9, p. 329]. In the present report the author compares the biometric curve obtained by measuring the trypanosomes found by him in the film of human blood with those of *T. vivax* made by various authors in different parts of Africa. The paper is illustrated by a coloured plate.

W. Y.

TEICHMANN (Ernst). **Die Empfindlichkeit von Naganastämmen gegen Arsen und Antimon.** [The Sensitiveness of Nagana Strains to Arsenic and Antimony.]—*Biochem. Ztschr.* 1917. Vol. 81. No. 5–6. pp. 284–318.

It has often been stated that all trypanosome strains are not equally sensitive to the same drugs. In order to decide definitely whether

among trypanosomes of the same species differences in sensitiveness to drugs exist, an examination is required which should be carried out under similar conditions with the greatest possible amount of material for purposes of comparison.

The author was able to undertake such an investigation with the nagana strains at his disposal. The strains in question, which are seven in number, are those used by BRAUN and TEICHMANN in previous work and designated by them, St. 4 (obtained from Hamburg where it had been preserved in rats and mice since 1911) and St. 30, St. 63, St. 68, St. 89, St. 90 and St. 90 Fl. (all of which were brought to Europe by BRAUN and TEICHMANN in 1913 from German East Africa) [see this *Bulletin*, Vol. 3, p. 421].

The author summarises the results of his work as follows :—

1. The East African nagana strains can be clearly distinguished as regards their sensitiveness to arsacetin ; these differences are equally prominent whether the drug be used prophylactically or therapeutically.

2. The strain which has been preserved longest in European laboratories (St. 4) is almost insensitive to arsenic.

3. This is equally true for infections resulting from inoculation of single individuals as for such derivatives of these strains as have become fast against their antibodies.

4. Similarly the East African strains and the West African strain (St. 4) showed differences in their sensitiveness to potassium antimony tartrate.

5. The prophylactic use of potassium antimony tartrate so far as length of action is concerned, yields results just as satisfactory for these experiments as the therapeutic use.

6. Arsacetin is a more efficacious remedy than potassium antimony tartrate in the case of infections with the East African strains.

7. Not every strain exhibits the same degree of sensitiveness to prophylactic and to therapeutic treatment with arsenic or with antimony.

8. The virulence of the strains bears no relation to their sensitiveness.

9. Each of the strains in question exhibits a specific difference in its behaviour towards arsenic and antimony. Its sensitiveness is not directed towards chemical influence in general ; it must be specially determined for each single remedy.

W. Y.

LAVERAN (A.). **Identification des virus de trypanosomiase équine marocaine de deux origines.**—*Bull. Soc. Path. Exot.* 1917. Nov. Vol. 10. No. 9. pp. 850–856.

Laveran has examined the biological relationship of *T. marocanum*, a parasite causing disease in horses in different parts of Morocco especially at Casablanca [*see* this *Bulletin*, Vol. 5, p. 414] and of a trypanosome found by FIORI and DELANOË in horses in Mazagan [*see* this *Bulletin*, Vol. 6, p. 377].

A goat immune to surra was found susceptible to the virus of Mazagan. A goat immune to the virus of Mazagan proved to be susceptible to debab, and furthermore a goat immune to the latter virus was found to be susceptible to that of Mazagan. Goats which had acquired immunity to surra and nagana as well as to *T. rhodesiense*

were susceptible to the virus of Casablanca. Finally a goat immunised against surra and the infections caused by *T. soudanense* and its variety *T. berberum* was sensitive to the virus of Mazagan. After immunisation to the last, the animal was inoculated with the virus of Casablanca but proved refractory.

The following are the conclusions :—The virus of Mazagan can be identified neither with *T. evansi* nor with *T. soudanense* nor *T. berberum.* The virus of Casablanca is not identical with *T. evansi, T. brucei* or *T. berberum.* The virus of Mazagan is identical with the virus of Casablanca (*T. marocanum*).

W. Y.

KUCZYNSKI (Max H.). **Ueber die Teilung der Trypanosomenzelle nebst Bemerkungen zur Organisation einiger nahestehender Flagellaten.** [The Division of Trypanosome Cells with Remarks on the Organisation of Closely Related Flagellates.]—*Arch. f. Protistenk.* 1917. Vol. 38. No. 1. pp. 94–112. With 2 plates.

The author deals in detail with the divisional processes in various trypanosomes, *T. brucei, T. lewisi, T. equiperdum* and *T. congolense* and compares them with those occurring in various free living flagellates and in *Prowazekella lacertae.* A brief resumé of previous work on the subject is given. The paper, which is well illustrated by a plate, is of a somewhat technical character and should be consulted in the original by those interested.

W. Y.

PONSELLE (A.). **Déterminisme de la culture du trypanosome de la grenouille,** *Trypanosoma rotatorium* **Mayer 1843.**—*C. R. Soc. Biol.* 1917. Nov. 10. Vol. 80. No. 17. pp. 824–826.

Whilst studying the bouillon-blood medium—one of the most suitable for the cultivation of *T. rotatorium*—it was found that the indispensable action of the bouillon depended not on the presence of particular nutritive substances, but on its acidity. The peptone bouillon habitually used in bacteriological laboratories is always acid to phenolphthalin, especially after sterilisation ; this acidity is due in great part to the presence of monobasic phosphates. It is the passage from a neutral medium (blood) to an acid medium which promotes in *T. rotatorium* the series of divisions bordering on cultural forms. By mixing 1 volume of infected blood with 10 volumes of a sterilised bouillon (of which the chemical constituents are given) one obtains, beginning with the large striated blood forms of *T. rotatorium,* after the rounded stage and repeated divisions of aflagellar individuals, the cultural flagellate forms in less than 24 hours. In the absence of monopotassium phosphate, or if this be replaced by the dibasic phosphate, the trypanosomes preserve their normal blood form without any tendency to cultural evolution.

Peptone (1 per cent.), gelatine (·5 per cent.) or even agar (·1 per cent.) protect the cultural forms against the trypanolytic action of the blood of the frog, probably owing to their absorbent power ; this trypanolytic action is not directed against the blood forms, but causes their rapid destruction so soon as they begin to pass into cultural forms.

W. Y.

CHAGAS (Carlos). i. **Processos patojenicos da tripanosomiase americana.** [The Pathological Lesions of American Trypanosomiasis].—*Mem. Inst. Oswaldo Cruz.* 1916. Vol. 8. No. 2. pp. 5–36. With 2 coloured plates.

ii. **Tripanosomiase americana. Forma aguda da molestia.** [American Trypanosomiasis. The Acute Form.]—*Ibid.* pp. 37–60. With 5 plates.

Practically the whole of the subject matter of these two important papers has appeared before in various forms. It is, however, interesting to have the disease described afresh by the greatest authority on it. In the second of the two papers, the author gives an account of the acute stage of Chagas's disease as it is seen in children; in adults this stage is evanescent, or practically absent. The child is generally brought by its parents to the physician for the first time, after a fortnight or so of high fever, for a general tumefaction of the body, due to the deposit of a mucoid substance in the connective tissue. The skin does not pit on pressure with the point of the finger. Further examination will show enlargement of the liver and spleen, and of the thyroid gland. This condition is well illustrated by a number of photographs. Specific trypanosomes will be found in the blood. If the child does not die, the tumefaction gradually subsides, and trypanosomes are then no longer to be found in the blood. The disease then proceeds to the chronic stage, recovery apparently never occurring. In a fatal case, the autopsy will show the characteristic infiltration of the skin, enlargement of the spleen, enlargement with fatty degeneration of the liver, enlargement of the mesenteric glands, and inflammation of the intestinal mucous membrane with desquamation of the epithelium. The heart will be found enlarged and its muscular tissue friable, with fatty deposits between the muscle-fibres. There may also be pericardial effusion. The lungs and pleura may show no macroscopic lesions. The thyroid will be found congested and enlarged, while in the cranial cavity there will be meningeal inflammation with adhesions, and punctiform haemorrhages into the cerebral substance. Microscopic examination will show that all these lesions are due to the penetration of trypanosomes into the tissue elements, with rapid metamorphosis into masses of elements resembling Leishman-bodies. The ovaries and uterus in girls and the testes in boys are similarly affected. This acute stage, being never attended by recovery, passes over into the chronic form, which simulates very closely the symptoms of ordinary sporadic cretinism. A discussion of the lesions in this stage is promised for a future memoir.

In the first of his two papers the author describes the histopathology of the disease. The various symptoms are shown to be due to the destruction of tissues by extensive infiltration with parasites like Leishman-bodies. Death from heart-failure is common, due to degeneration of the heart muscle from this cause. The infiltration of the cortex of the supra-renal capsules causes bronzing of the skin, and other symptoms similar to those of Addison's disease. The cells of the neuroglia of the nervous system are also attacked by the parasites, while the actual nerve-cells are respected, the result being various degrees of muscular wasting and paraplegia. The ovarian inflammation

results in early menstruation and excessive fertility in the female. The accompanying plates illustrate the majority of these lesions very graphically.

J. B. Nias.

KRAUS (R.) & ROSENBUSCH (F.). **Kropf, Kretinismus und die Krankheit von Chagas. 2. Mitteilung.** [Goitre, Cretinism and the Disease of Chagas.]—*Wien. Klin. Woch.* 1917. Aug. 30. Vol. 30. No. 35. pp. 1104–1105.

From a study of the literature of the subject and as a result of their own observations, the authors reach the following conclusions :—

1. In the mountainous regions of the Argentine are found *Triatoma* which are infected with *T. cruzi.* In some parts of these districts goitre and cretinism occur which, according to the authors' observations, correspond to the classical pictures of endemic goitre and cretinism. Acute cases of Chagas' disease have up to the present not been found by the authors.

2. In the same region, in the Calchaqui Valley, one does not meet with goitre or cretinism, but great numbers of infected insects are to be found.

3. In the provinces of Buenos Aires and Cordoba also goitre and cretinism do not occur, but, nevertheless, infected *Triatoma* are found.

4. In Argentina infected *Triatoma* are not responsible for Chagas' disease—neither the acute nor the chronic form. The causes are perhaps to be sought in the modification of the trypanosomes through the climate; on this point comparisons of virulence might give information.

5. The occurrence of Chagas' disease is not impugned. The acute form is chiefly characterised by the presence of trypanosomes in the blood and through such clinical symptoms as fever, enlargement of the lymphatic glands, increase in size of the spleen, etc.

6. The chronic form can be associated in its symptomatology with goitre and cretinism. The differential diagnosis is difficult in the mountainous districts.

7. In order to make clear the disputed points, it is necessary to demonstrate: firstly, whether in the mountainous regions of Brazil endemic goitre and cretinism occur, and secondly, whether there are in the Brazilian plains infected *Triatoma* and whether Chagas' disease also occurs there.

[For an account of the previous paper see this *Bulletin,* Vol. 7, p. 115.]

W. Y.

HARTMANN (Max). **Ueber die Schizogonie von** *Schizotrypanum cruzi.* —*Arch. f. Protistenk.* 1917. Vol. 38. No. 1. pp. 113–116. With 1 plate & 2 text-figs.

The author recalls that in 1910 he demonstrated that *S. cruzi,* in an aflagellar state, undergoes multiple division and that as a result large agglutinations of Leishmania-like parasites are formed; most

commonly this process occurs within endothelial cells, more rarely it is intercellular.

Lately Hartmann has re-examined his preparations and has been able to confirm and extend his previous observations. He found free uninuclear rounded up stages without a flagellum. Such forms grow and the nucleus and blepharoplast multiply until finally a stage is reached containing many nuclei and blepharoplasts. Sooner or later this stage undergoes division and hence a true schizogony occurs. Schizogony occurs in guinea-pigs intracellularly in greatly hypertrophied endothelial cells and also free in the capillaries of the lungs. In addition schizogony forms were found which did not contain the blepharoplasts. These blepharoplastless forms, which are of especial interest, relate to *Schizotrypanum cruzi* and have nothing to do with *Pneumocystis*; they can in no way be distinguished from the schizonts of many endoglobular blood protozoa (Haemosporidia), e.g., *Theileria parva*, and Haemoproteus. Hartmann points out that DOFLEIN asserts, in the recent edition of his text book, that SCHAUDINN'S conception of Haemoproteus and Leucocytozoon as trypanosomes which have, owing to their intracellular mode of life, undergone involution, is completely disproved by recent work and also that Hartmann's own order of Binucleata is untenable. In proof of this DOFLEIN relies chiefly on the work of WASIELEWSKI and WÜLKER on the schizogony of *Haemoproteus tinanculi*. Hartmann reproduces WASIELEWSKI and WÜLKER'S figure and compares it with one of his own representing schizogony in *S. cruzi* and claims that they are indistinguishable.

W. Y.

SCHWETZ. **Preliminary Note on the Tsetse-Flies of the Kabalo-Albertville (Lualaba-Tanganyika) Railway.**—*Bull. Entom. Res.* 1917. Dec. Vol. 8. Pt. 2. pp. 169–175. With 1 map.

The author points out the importance of the Kabalo-Albertville railway, connecting as it does the water-way of the Lualaba river with Lake Tanganyika, and so with Daressalaam. It measures 273 kilos. He surveyed the portion near the Lake before the line was built [see this *Bulletin*, Vol. 1, p. 56]. Only 14 days could be given to the present investigation. The vegetation is described in three sections. In the one near the river the country consists of open, slightly wooded meadow-land. In the intermediate section park and forest alternate. In the third the railway follows the river Lukuga till it joins Tanganyika; the valley is park-like, the river banks shaded. Here *G. morsitans* was common in 1911; it was now very rare, which the author attributes to progressive clearing. *G. palpalis* was only once seen, and it is concluded that these two species and *G. brevipalpis* are so rare close to the railway that they need scarcely be reckoned with. In the first section the windows of the train were bombarded by *G. morsitans*; *G. pallidipes* occurs, in smaller numbers, and *brevipalpis* is rare. In the intermediate section tsetse are few, but by search *palpalis*, *brevipalpis* and *pallidipes* may be found. It is admitted that the study is incomplete. The author does not believe that the presence or absence of *morsitans* is correlated with the presence or absence of

big game. [The author gives no indication of the season in which his survey was made. It is well known that the species of *Glossina* may be absent or scarce at one time of year and abundant at others.]

A. G. B.

SCHWETZ. **The Western and Northern Limit of *Glossina morsitans* in Northern Katanga.**—*Ibid.* pp. 165–168. With 1 map.

This subject was considered by the author in a paper summarised in this *Bulletin*, Vol. 7, p. 112. The results of the further investigation, the notes of which are here given, are confirmatory; the limit of *morsitans* in Katanga coincides more or less with that of the "park."

A. G. B.

HEAT STROKE.

GAUSS (H.) & MEYER (K. A.). **Heat Stroke. A Report of One Hundred and Fifty Eight Cases from Cook County Hospital.**—*Amer. Jl. Med. Sci.* 1917. Oct. Vol. 104. No. 547. pp. 554–564. With **7 charts.**

During July 1916, 158 patients—152 men and 6 women—were admitted to hospital in Chicago suffering from heat stroke and heat exhaustion. The monthly mean temperature was the highest on record, 78·4° F. Most of the patients (79·8 per cent.) were in the third, fourth and fifth decades. Labourers comprised 64·9 per cent. of the cases; the majority of the patients gave a history of alcoholism and details are given concerning the amount of beer consumed by 25 of them during the 24 hours preceding the attacks.

The following pathological changes were found at post-mortem examination: oedema of the leptomeninges, brain and lungs; cloudy swelling of the myocardium, liver and kidneys; fatty changes in the liver; petechial haemorrhages in the brain, viscera, and skin.

As regards symptomatology the period of prodromal symptoms varied from five days to a few seconds. The patients complained of headache, dizziness, malaise, anorexia, polydipsia, nausea, vomiting, diarrhoea, epigastric distress, restlessness, stupor, insomnia and dyspnoea. As a rule when the prodromal period was a day or more the temperature on admittance was not high, when only a few hours or less the temperature was high. Sometimes the attack came on instantaneously.

The temperature on admittance varied from 94° to 114° F. Following the hydrotherapeutic measures to which the hyperpyrexial patients were subjected, there was a sudden fall in the temperatures, varying from 2° to 14° F., subnormal temperatures being reached frequently. The time required for the temperature in hyperpyrexial patients to return to normal varied from 10 minutes to three days. When the return to normal took less than several hours recrudescences of 1° to 9° F. and one to five in number usually occurred. The terminal temperatures varied from 95° to 110° F.

The pulse rates on admittance were roughly proportional to the temperatures. The respiration of comatose patients was usually laboured, rapid, shallow and gasping. The skin was commonly hot, dry and cyanotic, and after a decrease in temperature cold and clammy. Nearly all the patients had involuntary bowel movements, many vomited and a few had haemorrhages per rectum and per mouth.

Details are given regarding the blood pressure, blood counts and condition of the urine. The great majority of the cases (129) were in coma on admittance, 10 were stuporous, but could be roused, 3 were in active delirium and 16 were conscious and rational. Fifty-eight died without regaining consciousness and 10 had relapses after regaining consciousness and died; the other two deaths occurred in patients who were conscious on admittance. Particulars are given relating to the reflexes and nervous symptoms.

The paper closes with the following account of the treatment adopted :—

All patients with a temperature of 103° or over were immediately placed in a tub of tap water, the level of which was just high enough to cover the body except the head, which was supported in a hammock packed with ice. Vigorous friction was applied to the entire body by four or more persons ; ice was freely added to the water, the friction being constantly maintained ; the temperature was taken rectally every minute. When the temperature reached 102° the patient was removed from the bath, wrapped in sheets or blankets, and returned to the ward. Generally 102° was reached in ten to thirty minutes. When the patients were returned to the wards their temperature usually continued to fall, frequently reaching subnormal 95° to 97°. Cardiac stimulants were given freely, strychnin, sodium caffein benzoate, digitalis, strophanthus ; an ice-bag was placed at the head and chipped ice was given by mouth. For subnormal temperature external heat was applied. For recurrences in temperatures up to 103° cold packs and alcohol sponges were given ; above 103° the patient was again given a cold water friction bath. It was observed that recurrent temperatures could not be reduced as easily as the initial high temperature, and in a few instances the temperature continued to rise in spite of prolonged friction in cold water. For restlessness and convulsions sedatives were used ; morphin, chloral hydrate, scopolomin, the bromids, and mechanical restraints.

W. Y.

AMAR (Jules). **Origine et prophylaxie du coup de chaleur.**—*C. R. Acad. Sci.* 1917. May 21. Vol. 164. No. 21. p. 834.

The causes of heat stroke are toxins produced by muscular fatigue and insufficient oxygenation of the blood. Several workmen and soldiers were made to carry a load weighing 60 kg. or set to work an ergometric cycle at 192 revolutions per minute with a friction of 3 kg. ; the shade temperature was between 35 and 39° C. It was found (1) that either in the shade or in the sun intense exertion when prolonged gave rise towards the fifth or sixth hour to functional troubles and to signs indicative of heat stroke—giddiness, somnolence, headache, pallor ; and (2) that regulated work interrupted by frequent rest, like moderate activity, never menaced the physiological state. Resistance to heat, with the same degree of fatigue, was always greater when owing to loose and light clothes respiration was not impeded. Heat stroke therefore does not occur without fatigue and it is not observed, or only rarely, when a good pulmonary ventilation is assured.

Great muscular efforts impede the respiration, and pulmonary ventilation is less by 25 to 30 per cent. than is the case in rhythmical periodic work, necessitating efforts as much increased. Again, the intense heat of the atmosphere produces a characteristic dyspnoea with short inspirations admitting into the lungs an insufficient volume of air ; and this air on account of its thermic expansion is poor in oxygen. Finally tight clothes and the bent position of the thorax diminishes by 20 per cent. on an average the volume of air breathed. Oxygen in the blood inhibits heat stroke by destroying the toxins of fatigue ; experience has shown that oxygen is in this respect a powerful antitoxin. The author has found it exceedingly useful to cause men engaged in a severe task to take very deep respirations at convenient intervals.

The following prophylactic measures are recommended for the use of soldiers especially :—

Allow the shoulders and the thorax the maximum of freedom. The clothes should be loose and light without a collar. Shift every heavy load towards the loins. Take on necessary occasions deep respirations with the head thrown back and the mouth open. Finally sniff a mixture of water and vinegar and moisten the face with it. This fluid produces a sensation of freshness which stimulates the respiratory reflexes.

W. Y.

NICHOLSON (M. A.). **The Reduction of Temperature in Railway Carriages running in Hot Weather.**—*Indian Med. Gaz.* 1916. Oct. Vol. 51. No. 10. pp. 369–371.

An experiment was undertaken in an ambulance train while travelling through the Sind Desert with a view to ascertaining the efficiency of certain methods of attempting to lower the temperature of a railway carriage running in hot weather.

Four similar ward cars were used. These were ordinary third class N.W.R. bogie coaches, fitted with upper and lower berths running lengthways down the car to accommodate 24 invalids ; a bathroom and lavatory and a sinkroom were provided at alternate ends, and six electric fans working from the roof were provided in each car.

In the first of these cars, three sheets were hung close under three of the fans and were kept saturated with water all day. In the second car, two one-maund [maund = about 82 lb.] blocks of ice were kept standing all day in the centre of the car. The third car was used as a control and the fourth had its roof and sides well soused with water at every convenient halt. The temperature of each car was taken at the same time every two hours and the results which are given in a table indicate that none of the above measures were of any avail in lowering the temperature.

The author quotes the work of LEONARD HILL and of PEMBREY as showing that in order to keep cool in hot weather man relies chiefly upon the evaporation of his own sweat.

After discussing the various factors involved Nicholson concludes that the chief principles of hot weather travelling are, firstly the avoidance of coupé and corridor compartments and the use of carriages running the breadth and if possible the length of a coach, secondly the intelligent use of fans, and thirdly the running at the highest speeds possible.

W. Y.

SHAKLEE (Alfred Ogle). **Experimental Acclimatization to the Tropical Sun.**—*Philippine Jl. Sci.* Sect. B. Trop. Med. 1917. Jan. Vol. 12. No. 1. pp. 1–22.

The experiments described in this paper were conducted on monkeys of the genus *Pithecus.* During the work four objects were kept in view : (1) To see if the monkey gradually exposed to the sun would undergo a change which would enable it to live in the sun throughout a hot day ; (2) if this change should take place, to learn its nature ;

(3) to determine the relative importance of the various meteorological factors which may combine to influence acclimatization; (4) to learn how far extraneous factors, such as work, excitement, clothing, drugs, diet, and disease, may influence the course of events.

The following are the author's conclusions:—

"1. The normal temperature of the Philippine monkey probably varies between 37·5° and 39·5° C.

"2. Unacclimatized Philippine monkeys (genus *Pithecus*) exposed to the sun in Manila live or die of heat stroke in the course of from several minutes to several hours, depending upon the conditions.

"3. The conditions making for a rapid death are: A hot sun; proximity of a large, hot surface, such as the ground or a roof; high relative humidity of the atmosphere; and a low wind velocity.

"4. The death under these conditions is due to an accumulation of heat in the body.

"5. The lack of any one of the above conditions may prevent death.

"6. The effect of the sun's rays alone on this monkey is comparatively slight.

"7. These monkeys on a suitable diet become acclimatized to the conditions mentioned, if exposure to the conditions is gradual.

"8. A small dose of atropin will cause the death of an acclimatized monkey by stopping the perspiration.

"9. The acclimatization consists in an increase in the sensitiveness of the nervous mechanism which regulates the body temperature. The increase in sensitiveness produces an increase in the rate of perspiration under the conditions named above, producing in this way what may be termed an immunity.

"10. This immunity is readily lost if the monkeys are kept in the shade.

"11. Some forms of sickness diminish the powers of resistance to the above-mentioned conditions.

"12. Some toxins produced in the intestine lower this resistance.

"13. Rabbits showed no increase in resistance when treated in the manner used to acclimatize monkeys.

"14. Healthy white men may be readily acclimatized to the conditions named, that is, to the tropical climate at its worst.

"15. The amount of sweating necessary to keep the body temperature of a healthy white man from rising above normal is not excessive, even when the man is doing considerable physical work in the midday sun in such a tropical climate as that which obtains at Manila, provided the man has been sufficiently long on a suitable diet and introduces himself gradually into the work in the sun.

"16. In the acclimatization of the white man the most important factor is the proper regulation of the diet.

"17. The effects from the tropical sun seemed to be exactly the same as the effects from the sun in the United States; that is, no effects were seen or felt in these experiments that were different from what would have been expected under like circumstances in the northern portion of the United States."

W. Y.

KOIZUMI (S.). [**Experiments bearing upon the Pathogenesis of Thermic Fever (Sunstroke).**] *Tokyo Igakukai Zasshi.* (*Mitteil. d. Gesellsch. z. Tokio.*) 1916. Nov. 5. Vol. 30. No. 21. pp. 47–48.

[From Review by R. G. MILLS].

In the cadaver of a person who had died from sunstroke there is an early onset of rigor mortis and a high post-mortem temperature; the blood is dark and clots slowly.

Rabbits were placed in specially constructed cages, in which the temperature and humidity could be accurately controlled, and were

kept under varying conditions as regards temperature and humidity for different periods of time. A temperature of 30°, 35° or 38° C. for 5–8 hours daily for ten days produced no symptoms beyond a rise of temperature, dyspnoea, faintness and diarrhoea. Analysis of N, Ca, SO_2, and NH_4 showed no great variation from the normal.

Increase of the humidity up to 85–90 per cent. did not suffice to cause the typical symptom-complex of sunstroke; the only pathological changes observed were an increase in the density of the blood and a decrease in its alkalinity. Prolonged exposure of an animal to a temperature of 41° C. caused slight injury to the red blood cells.

In other experiments the animals were caused to exercise vigorously under the same conditions. After 2–5 hours they suddenly became cyanotic, suffered from dyspnoea, were convulsed and died in a few minutes. In these cases the post-mortem signs were similar to those occurring in man, viz.: delayed coagulation of the blood and decreased alkalinity or acidosis. The blood was also of a dark colour, and haemolysis had occurred.

Under normal conditions the oxygen content of the blood of the animals was 14·59 per cent. and that of CO_2 35·67 per cent., but after exposure to a temperature of 35–37° C. for three hours the figures were respectively 5·58 per cent. and 11·67 per cent. The oxygen combining power of the blood of a rabbit under the conditions of heat and humidity for three hours at 35° C. was 41·9 per cent. but after exercise only 29·3 per cent. The normal colour and combining power was restored in the drawn blood by a short exposure to the air. Injection of the blood into other rabbits before and after exposure to the air produced very different results. The author believes that these experiments prove that the blood is unable to dispose efficiently of the products of metabolism which are produced in abnormal amounts under the severe conditions of exercise in high temperature and humidity.

W. Y.

BERIBERI AND POLYNEURITIS AVIUM.

CHICK (Harriette) & HUME (E. Margaret). i. **The Distribution in Wheat, Rice, and Maize Grains of the Substance, the Deficiency of which in a Diet causes Polyneuritis in Birds and Beri-Beri in Man.** —*Proc. Roy. Soc.* 1917. Dec. 1. Ser. B. Vol. 90. No. B. 624. pp. 44–60.

ii. **The Effect of Exposure to Temperatures at or above 100° C. upon the Substance (Vitamine) whose Deficiency in a Diet causes Polyneuritis in Birds and Beri-Beri in Man.**—*Ibid.* pp. 60–68.

i. The occurrence of cases of beriberi among the military forces in the Dardanelles and Mesopotamia, whose diet consisted largely of tinned foods and white bread or biscuit made from white flour, directed attention to the examination of these foods as causative agents. The foods by the heat sterilisation they receive are well known to be deprived of their anti-beriberi constituent. The authors therefore by a number of well considered experiments determined the nutritive properties of cereals generally, and wheat in particular. The work done by FUNK, COOPER, and others is first reviewed. Two methods for experimentation are applicable, preventive and curative. The former was the most satisfactory method of determining the vitamine content of the food stuffs since it gives more regular results but long and careful research is required so that curative experiments were also carried out. It was proved that in both the rice and wheat grain the anti-neuritic vitamine is concentrated mainly in the germ or embryo, a small amount only being present in the bran, all of which is absent in white flour. Therefore the importance is evident of including the germ in the flour from which the bread or biscuit is made, especially when the diet consists largely of tinned foods. It was found that "the daily ration of wheat germ required to be added to a diet of polished rice to prevent the onset of polyneuritis is the amount which administered by the mouth will cure a pigeon acutely ill with polyneuritis brought on by an exclusive diet of polished rice." It was also determined that the addition of wheat germ to a diet of polished rice sufficient to prevent polyneuritis also maintained the weight and general health of the birds. Rations in excess of this led to an increase in body weight and in the general well-being and vitality of the birds, whereas extracts of the rice bran or yeast, though sufficient to prevent polyneuritis, did not maintain weight. A large number of tables setting out the experiments are given which should be studied with the original.

ii. A further series of experiments was made to determine the influence of exposure to high temperatures on the vitamines in the different foodstuffs, the deficiency of which causes polyneuritis in birds and beriberi in man. Though many observations on this point have been made no accurate readings have been systematically taken before of the real temperature reached and maintained in the interior of the substances heated. The authors describe in detail the method employed and from the tests curves were constructed from which accurate estimates could be made of the temperatures actually

experienced by the materials exposed. From these they drew the following conclusions :—

(1). Exposure of wheat embryo to a temperature of about 100°C. for two hours resulted in no significant loss in anti-neuritic vitamine. If therefore it (the embryo) is included in the flour from which the bread or biscuit is made, it can be relied upon to retain its anti-neuritic properties after baking.

(2). At temperatures of about 120° C. however there was a swift destruction of the anti-neuritic properties.

When soluble yeast extracts containing about 35 per cent. of solids were similarly treated, slight loss of vitamine is evident after one hour's exposure to 100° C., relatively rather more than with wheat embryo ; but at 120° C. destruction of the vitamine was rapid.

P. W. Bassett-Smith.

CHICK (Harriette) & HUME (E. Margaret). **The Distribution among Foodstuffs (Especially those Suitable for the Rationing of Armies) of the Substances Required for the Prevention of (A) Beriberi and (B) Scurvy.**—*Trans. Soc. Trop. Med. & Hyg.* 1917. July. Vol. 10. No. 8. pp. 141–186. With 6 figs. [With Discussion.] *Jl. Roy. Army Med. Corps.* 1917. Aug. Vol. 29. No. 2. pp. 121–159. With 6 figs.

In this very interesting paper the authors give a short résumé of our present knowledge of the deficiency theory of beriberi and scurvy, which they consider is fully proved. Man requires for complete nutrition not only a suitable supply of protein, fat, carbohydrates, salts and water, but also an adequate amount of accessory food factors, called vitamines. The definite composition of these latter is not yet known, but there are essentially two, an anti-beriberi and an anti-scurvy vitamine. Each plays a special role in metabolism, each possesses distinctive properties, and they are differently distributed among foodstuffs. Tables are given showing the amount of various substances required to *prevent* the development of neuritis in birds when fed on polished rice (experiments carried out by COOPER, and later, by themselves) and also the minimum amount required to cure under similar conditions. They found that in the preparation of extracts there was always a large amount of loss in the active principle; for example, 10 grammes of dried peas was curative, whereas it took the extract of 40 grammes to give the same result. These tables show that the anti-beriberi vitamine is very widely spread, being present in a greater or less degree in almost every natural foodstuff, but that the principle source is found in the seeds of plants and the eggs of animals. They go on to demonstrate that this vitamine is fairly resistant to heat, not being destroyed at a temperature of 100° C. in two hours, and that it is most abundant in the germ of the cereals. Milk, cheese and potatoes are among the least valuable anti-neuritic substances.

Anti-scurvy vitamines are much less abundantly represented in food, and are much less stable, being easily destroyed by heat and drying. HOLST, FUERST, and FROELICH carried out much experimental

work with regard to scurvy and on these the further experiments by the authors were chiefly based. They used guinea-pigs but, as is shown, these animals are very susceptible to scurvy and very great care and attention had to be paid to the animals to eliminate loss of weight, etc., due to starvation and inanition, before they could obtain any useful results. The onset of the disease was gradual; generally after about 17 days there is evidence of tender joints, the weight declines, in about another 10 days the teeth become loose, and death soon follows, evidence of scurvy being present post mortem. The administration of fresh orange juice was rapidly curative except that the joints remained tender. A diagram is given showing the course of the disease in six typical experiments with and without anti-scurvy adjuncts to the food. The addition of autoclaved milk, though it did not prevent the scurvy, kept the animals in better condition.

The value of the various foodstuffs as preventive against scurvy and beriberi is given in a table which shows at a glance the most important substances that can be used, and it is noted that these results are in agreement with those of the Norwegian workers. The anti-scorbutic properties are present in all living tissues of plants, and to a lesser degree in those of animals. They are not present in dried vegetables, peas, and seeds, but as was originally shown by FUERST (1912) the anti-scorbutic principle is created anew with the beginning of active cell life, that is when the seed begins to germinate.

The efficiency of fresh fruit juices is well known, and in arctic and antarctic exploration that of fresh meat was recognised, but milk appears to be almost deficient in both anti-scurvy and anti-beriberi vitamines. Preserved lime juice gave disappointing results in the hands of the authors for the prevention and cure of guinea-pig scurvy, though HOLST and FROELICH (in 1912) found that it had distinct anti-scorbutic properties. [Further investigations are being carried out on this important subject.]

An interesting object lesson is given on the study of the conditions of our troops during the siege of Kut. In the early stage, beriberi occurred amongst the British troops, but *it then disappeared.* During the first two months they received a ration of wheat flour, but after that from one-third to one half of this flour was replaced by barley flour and coarse milled wheat flour. These men were also protected from scurvy by receiving an ample ration of horse meat. On the other hand the Indian soldiers were supplied with cereals and beans containing abundance of anti-beriberi vitamines; these had no anti-scorbutic properties and as they did not eat the meat, and fresh fruit and vegetables were not procurable, scurvy was very prevalent among them. The deduction is therefore drawn:—

"For the prevention of beriberi it is in the highest degree desirable that the germ (embryo) and the bran of wheat should not be excluded from the flour destined for manufacture of bread and biscuit for troops on active service. This is the more necessary when the troops are separated from fresh food supplies and the rest of the ration consists largely of tinned foods, seeing that these articles are deficient in *alt* vitamines, owing to their previous sterilization at high temperatures. . . . . To prevent scurvy, if a supply of fresh fruit or vegetables is not procurable, germinating pulses should be added to the diet."

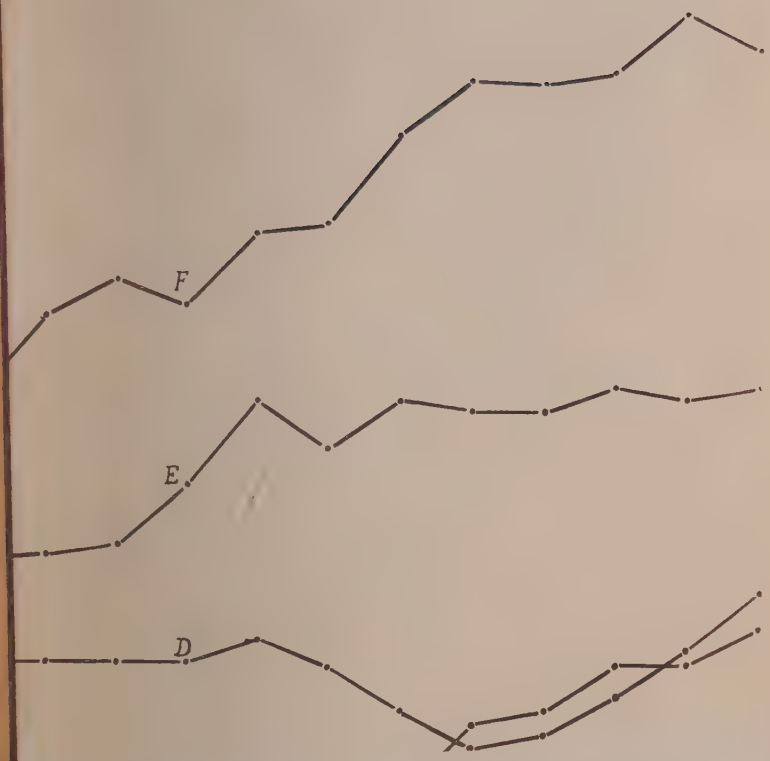
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TABLE IV.

Value of Foodstuffs as Preventive against Scurvy and Beriberi.

Foodstuffs.	Water content per cent. (Approx.)	Value against Beriberi.	Value against Scurvy.
CEREALS—			
Whole grain, wheat ..	10 to 13	++	0
Endosperm, polished rice		0	0
„ white flour (wheat)			
Bran, *e.g.*, rice		++	0
„ „ wheat ..			
Germ or embryo, *e.g.*, rice		+++	0
„ „ „ wheat			
PULSES—			
Whole, in dry condition ..	12	++	0
GERMINATED PULSES (or Cereals)	50	++	+++
VEGETABLES—			
Potatoes	80	0	++
Fresh, *e.g.*, cabbage ..	90	+	+++
„ „ onions ..			
„ „ carrot ..			
Desiccated vegetables ..	10 to 15	+	+ to 0 according to age
Pickled, *e.g.*, cabbage ..	—	—	0
FRUIT JUICE—			
Fresh, *e.g.*, orange ..	90	—	+++
„ „ lemon ..			
EGGS—			
Fresh	70	++	—
desiccated..	6	++	0
MEAT—			
Fresh	70	+	+
Tinned		0	0
MILK—			
Cow's, fresh	87	0	+ (slight)
YEAST—			
Pressed, autolysed ..	77	+++	0
Extract, commercial sample A	30	+++	0

— Signifies not investigated.

In a short appendix the method of preparing the germinating legumes for use is given. It is particularly important that the seeds should have free access of air when growing and that they should be cooked and eaten as soon as possible after germination, because if allowed to dry the anti-scurvy substances would be destroyed.

P. W. B-S.

COBB (R.). **Beriberi in North Borneo.**—Appendix to the Territorial Medical Report for 1916, State of North Borneo. 8 pp. (MS.)

Beriberi has been recognised in North Borneo for some years but has rarely shown any serious epidemic characters. Various estates and a few Government institutions have occasionally suffered, notably in the Leper Settlement in 1913. As rice is the staple diet such outbreaks are not unexpected and the returns from the Government Hospitals show that the greatest incidence is amongst paupers, opium eaters, gamblers and among the coolies employed on the rubber and tobacco plantations.

The high incidence at different hospitals could always be traced to special camps and estates. Further enquiry into these small epidemics showed that they were always associated with a deficiency in the food supplied, and in two instances to the temporary use of Saigon rice. The same difficulties were found as in most other Oriental communities in supplying and getting the natives to use unpolished rice and, as the report states, much depends on the careful supervision of the dietary of the camps by the managers, but these are backward in acting individually for fear others will not do so and thus they stand to lose their coolie labour. The following recommendations are made :—

(1). An import duty on all white unpolished rice.

(2). The provision of a sufficient ration of cooked food by the employers of labour, the word sufficient referring to both quality and quantity.

P. W. B-S.

TRAVIS (F. M.). **Bĕri-Beri, or Endemic Multiple Neuritis, with Report of Twenty-One Cases.**—*Kentucky Med. Jl.* 1917. Oct. 1. Vol. 15. No. 10. pp. 476–482.

The observations were made from cases occurring among prisoners, and it is stated that their cells were all clean and in good sanitary condition. Only three cases were taken from basement cells and the outbreak therefore was not due to damp. Twenty of the patients showed serous effusions, and oedema of the legs, scrotum, penis, and back was noted in all but one of these. About 50 per cent. showed a decided atrophy of the muscles with wrist or foot drop. Deficiency of food and overcrowding did not appear to be etiological factors. The paper deals chiefly with the clinical characters of the disease and, as there were no deaths, no pathological evidences were obtainable. Believing that the disease is one in which autointoxication plays an important part, the author's treatment was carried along the line of elimination and support, strict hygienic measures being enforced.

Medicinally, acetate of potash and digitalis were given for the oedema, with purgatives and strychnine. Abundant acid drinks (lemonade) were advised, and fresh fruit added to the diet. The cases were segregated and disinfectants were freely used.

P. W. B-S.

ALBERT (Jose). **The Pseudomeningitic Form of Infantile Beriberi.** (Proceedings of the Manila Med. Soc.).—*Philippine Jl. Sci.* Sect. B. Trop. Med. 1917. May. Vol. 12. No. 3. pp. 166–167.

Two clinical forms of infantile beriberi are generally described, the chronic aphonic and the acute pernicious cardiac types. The author

refers to three cases in which the symptoms of meningitis were most prominent but in each X-rays demonstrated the characteristic enlargement of the heart, and the curative effects of extract of tiqui-tiqui were rapid.

P. W. B-S.

MANALANG (C.). **Degeneration of Peripheral Nerves.**—*Philippine Jl. Sci.* Sect. B. Trop. Med. 1917. July. Vol. 12. No. 4. pp. 169–178. With 2 plates.

The object of this paper is to show that degeneration of nerves is very commonly found in other conditions than beriberi when examined by Marchi's method, and is therefore not a good factor alone on which to make a diagnosis. At Manila out of a total of 104 general autopsies, 88 showed microscopically degeneration of the peripheral nerves, 55 slight, 29 moderate, and 4 marked. Of these 88 more than half were between the ages of 20 and 50 years and 69 had nephritis of some form or other. The value of the deductions are much discounted as the author states that (1) in Manila beriberi is endemic; (2) there is the possibility of many unrecognised cases of mild beriberi dying of other diseases; also (3) there may be many cases who have recovered from beriberi and have died of other diseases. The subjects were all Filipinos, the working class of which are in general insufficiently fed upon an excessively non-nutritious and monotonous diet, which goes far to explain the high incidence of neuritis found in the 104 examinations.

P. W. B-S.

YOSHIKAWA (I.), YANO (K.) & NEMOTO (T.). **Studies of the Blood in Beriberi.**—*Arch. Intern. Med.* 1917. July 16. Vol. 20. No. 1. pp. 103–111.

The study of the blood in beriberi has received considerable attention from Japanese observers. The authors, using the refractometric method described by STRAUSS in 1904, applied this to beriberi cases and a number of tables of their results are given from which they draw the conclusion that the refractive index of the serum of persons suffering from beriberi often shows no deviation from the normal, but not infrequently there is a marked rise. The rise is generally considered to be due to an increase of the protein content, but it may also be caused by a retention of non-protein substances. A determination was made of the urea in the blood, using AMBARD'S coefficient, for 11 cases of beriberi. That of a healthy person ranges from 0·06–0·08; in beriberi it varied between 0·07–1·36. The two patients who had the highest coefficient died. Thirty-three patients were tested by other methods and from these results a considerable retention of urea was shown to be present in the most severe cases, which might be due either to lessened elimination from weak cardiac action, or increased protein metabolism; to clear up this, further study is required. They state that even when the clinical symptoms of a case are severe, if the function of excreting urea is intact, the prognosis is hopeful and that it is possible that the cardiac failure in beriberi is due to the accumulation of some unknown products in the blood, the elimination of which is coincident with the elimination of urea.

P. W. B-S.

CHUN (J. W. H.). **The Differential Leucocytic Count in Beri-beri.**—*National Med. Jl. of China.* 1917. Sept. Vol. 3. No. 3. pp. 113–115.

The author records the results of counts of 42 cases using 300 cells as a basis of his observations, but no record is given of the clinical differences of the cases. He gives the following as the average of the 42 observations :—

Finely granular oxyphiles	57·4%
Coarsely „ „	5·2%
Basophile leucocytes	0·4%
Hyalines	19·5%
Lymphocytes	17·2%

The hyaline cells were thus above the normal, but he states that the normal among healthy Chinese is 9·8 per cent., considerably higher than that found in Europeans.

P. W. B-S.

SUZUKI (Tadashi). **Ueber den Aminosäurengehalt im Säuglingsberiberi-Harn.** [Amino-Acids in Urine of Infantile Beriberi Cases.] [Japanese text.]—*Kyoto Igaku Zassi.* 1917. May. Vol. 14. No. 4. [Author's Summary in German, p. 48.]

The author estimated the amount of amino-acids in the urine of infants suffering from beriberi by means of VAN SLYKE'S method, and also made some experiments on cats and dogs. He found that in recovered infants the percentage was 2·6 and remained very constant. In cardiac cases and in the early acute condition there was a considerable increase, falling in the latter stages to its normal. He concluded that the increase of the aminoacids in infantile beriberi was probably brought about by difficult oxidation consequent on insufficient hepatic action; nevertheless the investigation showed that the intermediate nitrogen metabolism of beriberi in infants is distinctly injured even up to the sixth or seventh week of the disease.

P. W. B-S.

HULSHOFF POL (D. T.). **X-Acid as a Remedy in Polyneuritis and Beri-Beri.**—*Jl. of Physiology.* 1917. Dec. Vol 51. No. 6. pp. 432–439.

The history of Dutch investigations of the value of katjang idjoe beans (*Phaseolus radiatus*) in the treatment of birds suffering from polyneuritis and men from beriberi is recorded. The author finding that the beans were so effective attempted to isolate the active principle. The decoction was treated with lead acetate and the lead afterwards removed by H_2S, and CO_2 was passed through to remove the H_2S. The purified extract was then evaporated to dryness and crystals obtained ; these were acid and this acid substance was believed to be the active principle and was called " X Acid."

GRIJNS used this in the form of pills for polyneuritic fowls without success. The author gave it in solution to birds and obtained better results, and the amounts required for cure were estimated. It was found that the relative curative value of the beans decreases by process of extraction ; that is, the more the active principle is purified

the more it loses its effect. Ten gms. of the beans is required to cure a fowl but of the chemically purified decoction 600 gms. Further experiments were made by concentrating the X acid solution so that 1 gm. of dried extract dissolved in a small quantity of water was efficient for cure, and this was far more easy to administer. The details of the 28 experiments are set forth.

P. W. B-S.

KON (Yutaka) & OKAZAKI (Mitsuhisa). **On the Contribution to the Disease of Pigeon due to Partial Inanition.**—*Sei-i-Kwai Med. Jl.* 1917. Sept. 10. Vol. 36. No. 9. Whole No. 427. pp. 91–100.

A number of experiments were carried out by the authors to determine :—

(1). Whether pure rice starch contains some substance which causes beriberi and whether the rice bran contains an antagonising substance.

(2). Whether when birds are fed on fermented rice they get the disease sooner than when they are fed on untreated polished rice.

(3). Whether by administration of pure vitamines with polished rice the disease can be prevented.

As the bones tend to undergo a change when the animal is fed on an exclusive diet, the bones and marrow of diseased birds should be more particularly studied.

A large number of pigeons were used for these experiments and the following conclusions were arrived at :—The usual change in pigeons fed on exclusive starch or fermented polished rice showed itself on the 16–17th day. A condition of partial inanition a few days before is an important factor in the development of nerve changes and fermentation has nothing to do with them. The neural changes due to feeding on polished rice do not depend on the quantity given, and are not due to simple inanition, but they are related to partial inanition. The effective quantity of the substances contained in the rice bran is not absolute but varies according to the quantity of polished rice given. The relationship between the decrease ot bodily weight and neural changes is not absolute. The relationship between the neural changes and the hypertrophy of the heart or haemorrhage in the bone marrow is not constant.

P. W. B-S.

UNCLASSED FEVERS OF TROPICS AND DENGUE.

MARIANO (Francisco). **A dengue. Considerações a respeito de sua incursão no Rio Grande do Sul, em 1916.** [An Outbreak of Dengue in Rio Grande do Sul (Brazil) in 1916].—*Arch. Brasileiros de Med.* 1917. May. Vol. 7. No. 5. pp. 272–277.

Notes of an outbreak of dengue occurring in March, April and May, 1916, in Brazil. The symptoms were apparently classical. The number of cases is not stated. The outbreak was immediately followed by another one of influenza, which afforded a good opportunity for comparing the distinctive features of the two diseases. Dengue has been recognised in Brazil since the year 1846, and then received the local name of "polka," after the dance of that name, from the stiffness of gait which is exhibited by the patients.

J. B. Nias.

STEFKO (W.). **Dengue à Trébizonde (Turquie) en 1916.**—*Bull. Soc. Path. Exot.* 1917. Oct. Vol. 10. No. 8. p. 724.

The author states that dengue is very prevalent in Turkey, especially during the months of June and July, and that in the lower quarters of the town of Trebizond it spreads most. The intermediate host is the *Stegomia fasciata.* Deaths are very rare but post-mortem evidence of meningitis and acute gastric enteritis has been found. No details are given.

P. W. B-S.

YAMAGUCHI (K.), KOIZUMI (M.) & JONOMURA (K.). [**Dengue Fever.**]—*Juzenkai Zasshi.* (*Jl. Perfection Med. Soc. Alumni of Kanazawa Med. Sch.*). 1917. May 14. Vol. 22. No. 5. p. 45.
[From Review by R. G. MILLS.]

The authors state that the virus of dengue is in the blood and that so small a quantity as 0·00005 cc. is able to carry the disease, the carriers being *Stegomyia scutellaris, Desvoidea obturbans* and *Culex fatigans.* The first is the most dangerous and is infective within four days after having bitten a person suffering from the fever.

P. W. B-S.

COOMBS (C. F.). **The Recurrent Type of "Trench" Fever in Mesopotamia.**—*Lancet.* 1917. Feb. 3. p. 183.

A case of recurrent fever is described in an officer who was employed at the advance base and who had never been in the fighting line. In all, six attacks of pyrexia were experienced with a week's interval between each, the attacks being gradually reduced in intensity but producing an increasing amount of debility. Before the first attack beriberi symptoms were noticed and with the fever shin pains were marked. The syndrome of symptoms was similar to those of the recurrent type of trench fever noticed on both the Western and Eastern fronts. Blood examinations showed no evidence of spirochaetes and no indication of paratyphoid infection, but a polynuclear increase was present with the pyrexial attacks as has been recorded elsewhere.

The exact causation was therefore not determined. The usual blood sucking parasites common to most military areas were present. The case made a good recovery finally, unattended with sequelae. Two similar cases are mentioned but full notes were not obtainable.

P. W. B-S.

BLAKE (G. A.). **Probable Causes of Fever in the Waziristan Field Force.** —*Indian Med. Gaz.* 1917. Nov. Vol. 52. No. 11. pp. 393–394. With 1 chart.

During the period June 8 to August 8, 1917, from the 43rd brigade of the British troops 315 cases were admitted to hospital. Of these 236 were suffering from fever. In the absence of laboratory methods it was difficult to determine accurately the diagnosis. In rate of importance the fevers could be put down to malaria, most common at Manzal; sandfly fever, fairly frequent at Baji Khal; and a certain number due to the effects of heat, and temporary congestion of the liver. The charts do not show any definite characteristics.

P. W. B-S.

SHEARMAN (C. H.) & MOORHEAD (T. G.). **Bacillaemia due to Infection with *B. faecalis alkaligenes*.**—*Jl. Roy. Army Med. Corps.* 1917. Jan. Vol. 28. No. 1. pp. 104–112. With 3 charts.

The authors describe a small epidemic of cases in which the only likely cause was the *B. faecalis alkaligenes*, proved by isolation of the organism from the blood and by serum reactions. It is probable that under normal conditions this organism may be present and give rise to no clinical symptoms, but in climates where gastro-intestinal diseases are common the catarrhal condition set up may provide a suitable condition for the growth of the organism which then invades the blood stream. Two cases are described in detail and charts of the irregular pyrexia produced are given. The cases under Shearman were treated in the No. 17 general hospital in Egypt. The organism showed little pathogenicity for guinea-pigs and mice.

P. W. B-S.

HIRST (L. F.). **Observations on the Pathogenicity and Specific Characters of the *Bacillus faecalis alkaligenes*.**—*Jl. Roy. Army Med. Corps.* 1917. Oct. Vol. 29. No. 4. pp. 476–487. With 3 charts.

B. faecalis alkaligenes was first described by PETRUSCHKY in 1889 from human faeces and was considered by him to be the causative agent of a typhoid-like illness in man. Since that time it has been frequently isolated, and recently SHEARMAN and MOORHEAD in Egypt have described infections from this organism [see above]. The author at Alexandria has isolated the bacillus from the blood of 12 cases in which the clinical symptoms were more or less characteristic, associated with a pyrexia of moderate severity and duration.

An analysis of the characters of the various strains isolated by PETRUSCHKY, BERGHAUS, KLIMENKO and others is given in a table which is here reproduced. The action on milk and pathogenicity for animals shows considerable variation and CASTELLANI's strain is quite distinct.

AUTHORS.	Petruschky.	Klimenko. (Sub-Group I.)	Straubo Krais. (Strain 1.)	Straubo Krais. (Strain 2.)	Rochaix and Marotte.	Castellani	Shearman.	Hirst.
MOTILITY	+	Variable ..	++	++	++	+	Variable ..	Variable
FLAGELLA . ..	Peritrichal ..	Polar	Polar	Polar	—	—	—	Polar
GELATINE . ..	Not liquefied	Not liquefied	Liquefied ..	Not liquefied	Not liquefied	Not liquefied	Not liquefied	Not liquefied
BOUILLON . ..	Turbid . ..	General turbidity, pellicle deposit	Floccali pellicle	General turbidity, pellicle	General turbidity, pellicle	General turbidity ..	Turbidity slight, pellicle deposit	General turbidity, pellicle deposit
CARBOHYDRATES	Not fermented	Not fermented	Not fermented	Not fermented	Not fermented	Acid in mannite, glucose and dextrose inosite	Not fermented	Not fermented
LITMUS MILK ..	Very blue ..	Blue	Blue	Blue	Very blue..	Blue	Blue	Blue
MILK	—	Slow clarification	Clarification .	Clarification	Clarification	—	Occasionally peptonized	No clarification, 6 strains after three weeks
INDOL	Negative ..	Negative ..	Negative ..	Negative ..	Negative ..	Negative ..	Negative ..	Negative
PIGMENTATION .	Browning of potato	Light brown on potato	*Nil*	*Nil*	—	—	—	Brown on potato, browning of old agar cultures
PATHOGENICITY, INTRAPERITONEAL INJECTION	For guinea-pigs	Not pathogenic to guinea-pigs, white mice and rats	Not for guinea-pigs or mice	—	—	—	—	Not for guinea-pigs
AGGLUTINATION BY PATIENT'S SERUM	—	—	To 1 : 1,000	To 1 : 1,000	To 1 : 1,000 1 : 2,000	—	To 1 : 200	To 1 : 50
REMARKS	From description given in Flügge's Text-book	Characters of seven strains from various sources including Petruschky I and II	Strain isolated from blood of a case giving history of dysentery followed by irregular pyrexia	Strain isolated from urine during convalescence of case of irregular pyrexia	Two strains isolated from two cases of benign enteric infection	Characters tabulated in Chalmers & Castellani's Text-book	General characters of 11 strains isolated from blood	General characters of 9 strains isolated from blood

The author divides the organism found by him into two strains. In strain 1, motility was greater, reduction of neutral red more rapid, and milk was more frequently clarified than with strain 2. Some of the organisms recorded under the same name are probably different species. The organism is not infrequently present in the faeces under abnormal conditions as shown below :—

Abnormal stools.	Total.	*B. f. a.* found.
Enteric convalescents	43 ..	16
Dysentery „	57 ..	29
Normal stools	50 ..	Nil.

Usually the organism is one of low virulence to man, but under favourable conditions produced by some intestinal diseases may rapidly multiply and even gain access to the blood stream through damaged mucous membrane, when it sets up a recognisable clinical condition. It is suggested that the organism may be of use as an indicator of water pollution in Egypt.

P. W. B-S.

KAUNITZ (Paul) & TRAWIŃSKI (Alfred). **Ueber den Befund von *Bacillus suipestifer* im Blute eines kranken Menschen.** [The Isolation of the *B. suipestifer* from Blood of Case.]—*Wien. Klin. Woch.* 1917. Aug. 30. Vol. 30. No. 35. pp. 1098–1099.

From a Russian aged 30 who was admitted to hospital as a case of enteric the authors isolated from the blood on the third day of the disease an organism belonging to the para-typhoid B group, but giving the cultural reactions of the *B. suipestifer.*

The fever was of short duration and spleen enlargement was not noticeable. The blood showed a leucocyte count of 3,000 with a relative lymphocytosis. The organism when tested with immune serum of *para.* "A" and Gaertner showed no agglutination, very slight with *para.* "B," and high with *suipestifer* strains of SCHNUERER & TRAWIŃSKI, while the serum of the patient gave confirmatory results when tested with strains of the same organisms and agglutinated the homologous strain to a titre of 1 in 4,000.

P. W. B-S.

LUDWIG. **Febris palustris remittens.**—*Münch. Med. Woch.* 1917. July 24. Vol. 64. No. 30. pp. 969–970. With 8 charts.

Many irregular fevers have been lately described of indefinite etiology—a disease here called "febris palustris remittens" is the latest addition. The author states that he has observed in the east, 300 cases. The incubation period is three weeks, the course of the fever seven to ten days or less, the pyrexial curve is very remittent in type, and is associated with headache, pain in muscles and weakness, with few objective signs; jaundice and nephritis are not seen and complications are rare. Diagnosis has to be made from febrile catarrh, trench fever and febris quintana. For treatment, antipyretics and quinine are useful but are not specific.

P. W. B-S.

ROCKY MOUNTAIN SPOTTED FEVER.

FRICKS (L. D.). i. **Review of Rocky Mountain Spotted Fever Eradicative Work conducted by the United States Public Health Service in the Bitter Root Valley, Montana, 1915-16.**—*Montana State Bd. Entom.* 2nd Bien. Rep. 1915–16. 1916. Dec. 15. pp. 24–27.

ii. **Rocky Mountain Spotted Fever.**—*Ibid.* pp. 28–34.

It is known that the majority of ticks which transmit spotted fever in the Bitter Root region breed on domestic animals, horse and cattle, as they graze over the foothills during the spring months, and that dipping the animals will not alone eradicate Rocky Mountain Spotted Fever from this region. Therefore the number of these animals should be reduced in every practical way, and the destruction of small rodents in the infected districts is highly desirable. The greatest difficulty in dipping is the weather, a long cold season rendering dipping impracticable, and the expense is out of proportion to the good done.

In a report of laboratory investigation of the virus by the same author, it has been shown that man, Rhesus monkeys, and at least six varieties of small wild rodents found in the region are susceptible to infection, as also guinea-pigs and white rats, while white mice are immune. The virus is transmitted by the bite of wood ticks and recovery is followed by complete immunity. The virus multiplies in the tick and is transmitted to her progeny; it may be propagated indefinitely in guinea-pigs but dies within a few days outside the animal body. It will not pass through the Berkefield filter and most attempts to cultivate it anaerobically have failed. The similarity of the fever to typhus has led to further investigations and ten strains of anaerobic bacilli have been obtained from blood of infected animals, but not so frequently as PLOTZ was able to recover the *B. typhi exanthematici* from typhus cases; the writer however only used 5–10 drops of infected blood instead of 2 cc. These organisms were not pathogenic to guinea-pigs. The author devised a new medium and technique and obtained the following results using only animal inoculations from the cultures and immunity tests. Ninety-seven guinea-pigs were inoculated and afterwards tested with 0·5 cc. of a known spotted fever virus. All the animals injected with cultures less than two weeks old were unprotected. Three guinea-pigs out of ten inoculated with cultures 21–25 days old showed definite lesions of spotted fever or were immune to the active virus injected later. From this it is concluded that a multiplication of the virus occurs in the cultures.

The author was also able by centrifuging infected serum for four to six hours at 2,000 revs. per minute to separate the virus from the supernatant fluid and this sediment of centrifuged infected blood stained with dilute Giemsa showed in the serum many bright red granular bodies, single and in pairs, accompanied by light blue bodies and in the red cells highly elongated chromatin bodies in close approximation to larger light blue bodies; the chromatin body may be 1μ in diameter; the red cells themselves stain normally. These

appearances were never found in control specimens and their presence was considered very significant, but as they resemble those described by SEIDELIN in yellow fever which have been said by LOW and WENYON to be found in normal guinea-pig blood the author hesitates to draw any definite conclusions from their presence, but he regards them as probably protozoal in origin.

P. W. B-S.

KING (W. V.). **Report on the Investigation and Control of the Rocky Mountain Spotted Fever Tick in Montana during 1915-16.**—*Montana State Bd. Entom.* 2nd Bien. Rep. 1915–16. 1916. Dec. 15. pp. 13–23.

During 1915–16 the epidemic of Rocky Mountain Spotted Fever had spread from the original area in the Bitter Root valley in Western Montana, a mild though exclusive epidemic being noted in Eastern Montana. The disease is known to be conveyed by the wood tick *Dermacentor venustus*, and efforts have been made to control the spread of the disease by (1), destroying the ticks, (2), removing the natural hosts on which they live, (3), protecting the domestic animals from infection. Very thorough methods were established consisting in the periodic dipping of cattle and horses in disinfectant baths to destroy the engorged adults, and also when this was not possible, removal of the ticks by hand picking. Ground squirrels, which are known to harbour the ticks, were very largely destroyed by poisoning or by shooting; 50 per cent. at least of these rodents have been killed off. It was believed that sheep might prove to be useful in clearing off the ticks, for these become entangled in the wool and die. An experiment with 1,000 sheep in an area of 1,200 acres has been tried but the result is not so far satisfactory, for it was found that the number of ticks which developed on the sheep were more than sufficient to maintain a normal supply. The active period of the adult tick lasts from March to June; therefore during the spring infected pastures should not be used or stock, the animals being kept in tick-free areas. Regulations have been drawn up by the State Board of Entomology, dividing tick infected areas, providing dipping vats and tanks, enforcing a close quarantine on all domestic animals and the premises of persons who fail to bring their animals for dipping, restriction of the movements of animals from infected areas, and prohibiting entrance of animals into any tick controlled districts between February and July.

P. W. B-S.

PARKER (R. R.) & WELLS (R. W.). **Some Facts of Importance concerning the Rocky Mountain Spotted Fever Tick,** *Dermacentor venustus* **Banks, in Eastern Montana.**—*Montana State Bd. Entom.* 2nd Bien. Rep. 1915–16. 1916. Dec. 15. pp. 45–56.

The conditions present in Eastern Montana were found to differ from those in Western Montana, and the measures adopted for the latter were inapplicable to the former. A special investigation was made, therefore, in this area from March to September, 1916, to control the danger. The country consists of river and creek, valleys and hills; the low land is covered with sage brush and trees are scarce; cotton

woods are found along the rivers. Several species of ticks are found, the most abundant being the *D. venustus* which transmits the fever. These vary in number from year to year. In 1915 they were particularly abundant. Horses, cattle and sheep are the domestic animals chiefly raised, and these frequently pasture on the open land and infected areas. Twenty-six species of wild mammals are found; of these the jack-rabbit is an important natural host of the tick, and 66 per cent. were found to be infected, but ticks were also found on many other rodents and on prairie dogs, and it is stated that the latter animal is an efficient larval host under laboratory conditions. Adult ticks are found on horses, cattle, sheep, dogs, cats and pigs, and in 1915 they were commonly found, sometimes in considerable numbers, on men from March to August, but in 1916 they were much less abundant. The residents fully recognise the tick as the transmitter of the disease and exercise care to prevent them becoming attached to their persons. In Eastern Montana, where the hosts both wild and domestic have unrestricted freedom, the infestation in any given area is less severe than in naturally limited or fenced areas, such as the Bitter Root Valley in Western Montana.

P. W. B-S.

CUMMING (James G.). **Rocky Mountain Spotted Fever in California.**—*Jl. Infect. Dis.* 1917. Nov. Vol. 21. No. 5. pp. 509-514. With 4 figs. & 1 chart.

Rocky Mountain Spotted Fever, which is so common in Montana, was shown by KELLY to exist also in California [see this *Bulletin*, Vol. 9, p. 65], and he collected the records of 32 cases spread over the last 14 years, but it was not until 1916 that the disease was actually proved there by animal experiment. The author describes and figures two cases in which successful inoculations were made, first into monkeys and then into guinea-pigs. Eighty passages of the virus from the first case are recorded, and this is also being maintained in ticks. The virulence of the virus increases or decreases according to the period of the fever when the blood is taken: if taken on the first day high fever was induced on the second day in the inoculated animal, but if taken at the end of the febrile stage the incubative period could be prolonged 8–10 days. The more prolonged the incubation and the lower the virulence of the toxin, the more pronounced the swelling of the scrotum would be in the injected animal. The author states that this characteristic can be used as a means of differentiating Rocky Mountain spotted fever from typhus, the disease with which it is most likely to be mistaken [but see this *Bulletin*, Vol. 11, p. 141].

P. W. B-S.

RAT-BITE FEVER.

KITAGAWA (J.) & MUKOYAMA (T.). **The Etiologic Agent of Rat Bite Disease. Preliminary Report.**—*Arch. Intern. Med.* 1917. Sept. 15. Vol. 20. No. 3. pp. 317–328. With 2 coloured plates & 4 text-figs.

FUTAKI in 1916 discovered spirochaetes in the blood and tissues of patients suffering from rat-bite disease. The spirochaete was pathogenic to guinea-pigs and could be transmitted from man to these animals direct. The authors add another case to those already brought forward in Japan and give the results of their experiments. Injected monkeys showed fever on the tenth day and guinea-pigs on the eleventh; white rats were also successfully inoculated. Two types of organisms were obtained, type "A" in guinea-pigs, 6–8μ long, and generally with four to eight curves, and type "B" in white rats generally 3–5μ long with sharper curves and less pointed at the ends, but with practically the same number of spirals. The greatest number of spirochaetes were found in the kidneys. Many more spirochaetes were found in animals from which the spleen had been removed during life than in normal ones. One specimen of type "B" was noted in which two spirochaetes had become so closely connected that they appeared as one specimen undergoing division. By staining, no differential characters were demonstrated between type "A" and "B." The authors hold the view that in these spirochaete infections the organisms undergo marked but gradual modifications with regard to form and toxicity, and that salvarsan is efficacious in treatment. A number of complement fixation tests were carried out using the ordinary antigen and one made from the heart and liver of guinea-pigs containing spirochaetes. In one case the reaction to the antigen of type "A" proved positive in a case of rat-bite disease. A large number of drawings of the different spirochaetes found are given and two excellent coloured plates. It is doubtful whether these two types represent two different organisms, and a definite opinion cannot at present be given, but it is noted that spirochaetes obtained from inoculation with lymph gland and plasma derived from the same patient appeared to be of different sizes.

P. W. B-S.

KANEKO (Renjiro) & OKUDA (Kikuzo). **A Contribution to the Etiology and Pathology of Rat-Bite Fever.**—*Jl. Experim. Med.* 1917. Sept. 1. Vol. 26. No. 3. pp. 363–375. With 1 chart & 3 plates.

The authors had the opportunity recently in Japan to make a post-mortem examination on a typical case of rat-bite fever and made careful studies of the tissues; they were able to confirm the work of FUTAKI that spirochaetes are the cause of rat-bite fever. They also came to the conclusion that the long and short type varieties belong to the same species of spirochaetes. Attention was chiefly paid to the supra-renals and kidneys, as ISHIWARA found the organisms mainly in the supra-renals, and it is in these positions in Weil's disease that they are most

frequent. They were able to find numerous organisms, particularly in the kidneys, and these were almost exclusively present in the casts in the straight tubes and loops of Henle. In the supra-renals they were in the cortical cells. The forms of the organisms were so varied that at first it appeared as if a variety were present. Two types predominated, a long and a short, but there was every gradation. The long forms are 6–10μ long, have numerous small steep irregular waves, and are like the long forms of FUTAKI; the short variety are identical with those described by ISHIWARA, FUTAKI, and IDO. As in Weil's disease, at first the spirochaetes circulate in the blood, while in the convalescent stage following the development of immune bodies they are found in the kidneys, and these antibodies in the course of the illness in man act on the spirochaetes, leaving various irregular so-called degenerate forms. In animals, in which no specific antibodies are found, the spirochaetes retain their typical short form (as found in the blood of patients at the height of the disease, and the typical form of ISHIWARA and FUTAKI in animals). It is noted in confirmation of this that the long forms occur almost exclusively in human tissues. A full description is given of the pathological anatomy of cases of the disease with coloured plates and drawings of the organisms.

P. W. B-S.

TSUNEOKA (R.) **Ueber die Spirochaeta von Rattenbisskrankheit.** [Japanese text.]—*Kyoto Igaku Zassi.* 1917. May. Vol. 14. No. 4. [Author's Summary in German, pp. 46–48.]

The author's observations on two cases of rat-bite fever with animal experiments from them, agree with those of FUTAKI and others in demonstrating that the spirochaete found is the true causative agent of the disease, and that it is infective to man, guinea-pigs, rats, and mice. The organism is found both in the saliva and the urine, and infection can be transmitted by either. A second form of spirochaete is occasionally found in the experimental guinea-pig, concerning which further research is required.

P. W. B-S.

IDO (Yutaka), ITO (Hiroshi), WANI (Hidetsune) & OKUDA (Kikuzo). **Circulating Immunity Principles in Rat-Bite Fever.**—*Jl. Experim. Med.* 1917. Sep. 1. Vol. 26. No. 3. pp. 377–385.

The authors carried out experiments in Japan to determine whether there were present in the serum of patients having rat-bite fever any immunity substances specific for the spirochaetes of the disease. The spirochaetes used were from guinea-pigs which had been infected through the bite of rats and not those obtained direct from men. The serum was from three patients three months or more after being bitten. With dark ground illumination using equal parts of guinea-pig's blood containing spirochaetes and patient's serum the destruction of the spirochaetes was caused, the controls being still active; weaker dilutions of the serum were less or not at all effective. Pfeiffer's test was then carried out using the peritoneal cavity of another guinea-pig. In the test cases the spirochaetes were destroyed but were active in all the controls, and in experimental animals spirochaetes were found in the blood of

the controls five days after injection but did not develop in those treated with the serum, thus proving the efficacy of the serum in protecting the guinea-pigs against rat-bite infection. The injection of 1–3 cc. of immune serum into infected guinea pigs, intra-peritoneally, intravenously or subcutaneously gave negative results, probably due to the small amount of serum used, but 1 cc. was effective in mice when given intravenously in one, and partially in two given intra-peritoneally. It is therefore evident that the blood serum of convalescents contains antibodies specific against the causative agent of rat-bite fever and the etiology has been definitely established, also that the immune body in the serum during the convalescent stage of rat-bite fever is not equal in efficacy to that contained in the serum of spirochaetosis icterohaemorrhagica.

P. W. B-S.

i. DE MELLO (Froilano) & MENEZES (Caetano Francisco). **Um caso de Sodokú em Gôa.** [A Case of Rat-Bite Fever at Goa.]—*Bol. Ger. Med. e Farmacia.* Nova Gôa. 1917. May. Vol. 4. No. 5. pp. 175–178.

ii. DE SOUSA (Loreto). **Segundo caso de Sodokú em Gôa. (Diagnostico retrospectivo).** *Ibid.* pp. 179–180.

i. A case of rat-bite fever, occurring in a native girl aged 10 years, presenting no features of novelty, except that the child was taken by her parents to a well at a place called Amona, of which the water has a reputation for curing snake-bite. Besides ablutions with the water the body of the patient was rubbed with sandal-wood oil under direction of the priests. The symptoms of the disease naturally subsiding at the end of 45 days, the cure was of course put down by the patient's friends to the hydrotherapy. According to the author, the waters of the well are simply slightly saline.

ii. A presumed case of rat-bite fever in a woman, of which the diagnosis was not made at the time. This patient also received treatment at the holy well above-mentioned, with a similarly favourable result, the symptoms finally disappearing during the course of the cure.

J. B. N.

i. BAIS (W. J.). **Rattenbeetziekte.** [Rat-Bite Disease.]—*Geneesk. Tijdschr. v. Nederl-Indië.* 1917. Vol. 57. No. 3. pp. 357–367. With 1 chart.

ii. PONDMAN (A.). **Een geval van Rattenbeetziekte.** [A Case of Rat-Bite Disease.]—*Ibid.* pp. 368–376.

i. A case of rat-bite disease occurring in a woman, the chief point of interest being that the patient was bitten in the breast during the night by a cat which was hunting a rat. The patient was bitten about the middle of September, and entered hospital with the usual symptoms of the disease on the 17th of October. The course of the case is shown in a chart. Two injections of neo-salvarsan were given, the first of 600 and the second of 900 milligrammes, at a week's interval, with the result that the temperature fell steadily to normal after the second injection. All symptoms had disappeared by the 27th November.

ii. A case of rat-bite disease in a man who was bitten in the thumb by a rat. The symptoms were of the usual character. After a single injection of 500 mgm. of neo-salvarsan the temperature dropped to normal, permanently.

J. B. N.

NIOWAKA (I.), YOSHIZAWA (I.) & MUMEMOTO (E.). [**Spirochaetosis in the Guinea Pig.**]—*Tokyo Iji Shinshi* (*Tokyo Med. News*). 1917. Jan. 20. No. 2007.

[From Review by R. G. MILLS.]

From the blood of guinea-pigs suffering from an epidemic disease, the authors isolated a spirochaete which was assumed to be the causative agent. Injections of cultures of this organism into healthy animals caused a'opecia of the circumocular and dorsal regions. These symptoms were noticeable features in the naturally infected animals. Intraperitoneal or subcutaneous injection of blood from infected animals, or subcutaneous injection of an extract of infected organs, caused a rise of temperature in from 3–7 days. The animal was acutely sick during this febrile period and until the temperature regained the normal level. After an interval a second period of pyrexia occurred. Immediately after the paroxysm the number of organisms present in the blood was increased. Experimentally, the infection was transmitted :—

1. By causing an infected animal to bite a healthy one.
2. By the injection of saliva from an infected guinea-pig beneath the skin of a healthy animal.
3. By caging a healthy and sick animal together.

In this last case no lesion could be found by means of which entry of the organisms had taken place ; and it was assumed, since the organism is present in both the urine and faeces of infected animals, that transmission of the parasite had been brought about by this agency.

The authors consider that this organism is the same as that causing rat-bite fever and they state that its morphology, immunological reactions and the results obtained from animal experiments prove it to be identical.

R. P. Cockin.

IZUMI (G.) & KATO (M.). [**Cat-Bite Disease and its Pathogenicity.**]—*Tokyo Iji Shinshi* (*Tokyo Med. News*). 1917. Apr. 28. No. 2021. pp. 1–6.

[From Review by R. G. MILLS.]

Cat-bite disease in Japan was first described by FUJIDA & SATO in 1902. Since that time records have been gradually accumulating and now the authors bring forward proof that it is identical with rat-bite fever, at least as far as its causal organism is concerned. The clinical history of the cases is very similar to those usually described as rat-bite fever, an incubation period of 10 days to 2 or 3 weeks, premonitory symptoms, then fever, infiltration of the skin, lymphatic implication, pains in the joints and muscles, and enlargement of the spleen. The fever is of a relapsing type, the intervals being 3–9 days. Maculae

appear first in the area of the bite, then on the limbs. The part bitten often heals with a small scar, or it may ulcerate, sometimes deeply. The prognosis is generally good except in cases of extreme age or in debilitated persons. The course is generally 2 to 3 weeks if there is proper treatment; if not it may extend over months. Salvarsan has given the best results. FUTAKI & ISHIHARA each discovered a spirochate in the cases, and this has been confirmed by IDO, ITO, WANI, and OKUDA.

To determine the relationship of the spirochate the authors carried out some serum experiments and found that the serum of a cat-bite fever case when mixed with an equal part of guinea-pig blood containing rat-bite fever spirochates caused complete loss of activity, whereas controls with normal serum and syphilitic serum were unaffected. The agglutinating power is however quite weak and not seen in a dilution of 1 in 2 of the serum. One cc. of guinea-pig blood rich in rat-bite spirochaetes mixed with 2 cc. of the patient's blood was injected into the peritoneal cavity of a guinea-pig and removed after an hour; no organisms were found, but in a control experiment using normal serum the spirochaetes were abundant and motile. The guinea-pig in the first experiment remained healthy; the latter died and its blood contained motile spirochaetes. The identity of the organisms in rat-bite and cat-bite disease appears, therefore, to be established.

P. W. B-S.

KITAGAWA (J.). [**Clinical Experience with Cat-Bite Disease.**]—*Saikingaku Zasshi.* (*Jl. Bacteriol.*). 1917. May 15. No. 260. pp. 422–423. [From Review by R. G. MILLS.]

The author, who treated two cases, considers this disease to be a spirochaete infection similar to that due to rats. The spirochaetes were found in the blood of both cases. Guinea-pigs inoculated from the patients became infected and one bitten by the cat that had caused the original infection also developed spirochaetes in the blood.

P. W. B-S.

JAPANESE RIVER FEVER.

MIYAJIMA (M.) & OKUMURA (T.). **On the Life Cycle of the "Akamushi" Carrier of Nippon River Fever.**—*Kitasato Arch. Exper. Med.* 1917. Apr. Vol. 1. No. 1. pp. 1–14. With 3 plates, 2 text-figs. & 1 chart.

The Nippon River fever, "tsutsugamushi disease" or Kedani fever has long been known to be associated with the presence of a small mite, the Akamushi or, as the authors now call it, *Leptus Akamushi*. These parasites are very difficult to rear but this has now been successfully carried out from the egg to the fertilised imago. The paper contains very full descriptions of the mite in all its stages, the technical details of which are too long to attempt to summarise, but are well shown in the excellent coloured plates and figures. The mature female appears to lay only one egg at a time. The larva, with six legs, attaches itself to warm blooded animals, particularly field mice, for three or four days; it then shelters under the ground and in five or six days becomes the eight legged nymph which closely resembles the mature tick. The nymph requires moisture and is not parasitic, feeding on vegetable juices. After ten weeks in captivity the nymphs became imagines which are considerably larger than the nymphs; these also feed on the juices of plants. Twenty-eight laboratory hatched larvae were put upon a Japanese monkey and these remained attached for three or four days. Only two of the localities bitten showed changes, inflammation and ulceration followed by enlarged glands in seven days; the animal suffered from a smart attack of fever when it was very ill, but there was no exanthem characteristic of the human disease. This experiment is stated to confirm the mite theory of the transmission of tsutsugamushi disease established by KITASHIMA & MIYAJIMA in 1908.

P. W. B-S.

HAYASHI (N.). [**Studies on the Pathogenesis of Flood Fever, Tsutsugamushi.**] — *Saikingaku Zasshi.* (*Jl. Bacteriol.*). 1917. Feb. 10. No. 257. pp. 151–152.

[From Review by R. G. MILLS.]

The author claims that the virus transmitted by the Trombidium (mite) is a piroplasm. Monkeys, guinea-pigs, and calves were inoculated from the patient and the blood, lymph, glands, and other organs were stained by Giemsa. In all, large giant cells were found in which were seen three kinds of granules, rod shaped masses, globular forms and annular masses, but transitional specimens were met with. The rod shaped forms were most common in the lymphoid tissue of the guinea-pigs.

P. W. B-S.

RELAPSING FEVER.

NUTTALL (George H. F.). **The Part played by *Pediculus humanus* in the Causation of Disease.**—*Parasitology.* 1917. Nov. Vol. 10. No. 1. pp. 43–79. With 1 plate.

After a chronological and critical account of the contributions of various workers to the solution of the problem of the transmission of relapsing fever Professor Nuttall gives an excellent summary. As the facts are by no means well known and have been wilfully or ignorantly misrepresented, it is reproduced in full :—

"Epidemiological evidence, as in the case of typhus, points to relapsing fever being louse-transmitted. The two diseases occur under like conditions: personal filth and squalor, the close contact of persons through overcrowding, facilities being offered for the propagation of lice by the continuous wearing of clothing day and night for weeks or months on end. All recently collected evidence (from India, North Africa, Germany, Russia and Serbia) proves that lice are constantly present on infected persons. These remarks apply equally to typhus, which, as already stated, may coexist with relapsing fever in epidemic form. Judging from the accessible records, relapsing fever appears to be somewhat more restricted than typhus in its geographical distribution. It has been conclusively demonstrated by carefully conducted experiments that *Pediculus humanus* serves as a carrier of *Spirochaeta recurrentis* the causative agent, from man to man.*

"When lice imbibe infected blood, the spirochaetes disappear rapidly from their alimentary canal and are not discoverable even by the ultra-microscope for a period of about 2–6 days after the insects have fed. The spirochaetes reappear in the coelomic fluid of the lice usually on the 8–9th day. They at first appear small, but, as time proceeds, they attain the dimensions and appearance they possess in human blood during the attack. When lice feed on infective blood, the number of insects that become infected with spirochaetes ranges from 10 to 42 per cent. The spirochaetes are hereditarily transmitted in the louse, for the offspring of an infected female has been shown to be infective. This persistence of the spirochaetes in the louse no doubt serves to maintain them in nature. It has only been through the successful raising of lice under laboratory conditions, coupled with the use of monkeys and occasionally man for infection experiments, that it has been possible to demonstrate the phenomena herein described.

"Although lice may be infective for a few hours after they feed on relapsing fever blood, it is probable that infection will rarely occur by their transference from man to man soon after feeding. When a louse has fed, it usually remains quiet, whilst digesting its meal. When lice have hungered for any length of time, as we have frequently observed, they feed to excess and take a longer time to digest the large amount of blood imbibed. If such lice are kept cold the process of digestion is impeded, and I have no doubt that any spirochaetes which they may harbour will remain virulent for longer periods, as I found was the case in bugs. How long gorged lice may remain infective at a low temperature remains to be determined. The experiments herein recorded point, however. to a rapid loss of infectivity in lice under ordinary conditions prevailing after an

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* "Töpfer [*Münch. Med. Woch.* 1916. Vol. 63. p. 1571] has the temerity to state that the work of Sergent, Nicolle, and their colleagues, is not 'einwandsfrei.' He then proceeds to repeat their work. A few comparatively trivial experiments are described which are merely confirmatory, but in his opinion (!) afford the first demonstration that lice convey relapsing fever. Töpfer's behaviour in this matter, flatly speaking, is thoroughly dishonest."

infective meal. The spirochaetes vanish in lice in which they subsequently reappear. Just before their reappearance, usually on the sixth day, but at times on the third to the fifteenth day, the lice have been found to be most infective. The infectivity of the louse does not depend upon the presence in its body of visible spirochaetes, in fact when spirochaetes reappear and attain their full size the lice are non-infective (Nicolle). This, coupled with the observation that human blood is infective during the apyrexial stage when spirochaetes cannot be found in the blood (Sergent and Foley), certainly bears out the view which I have upheld with others, that spirochaetes are Protozoa, for they obviously undergo a cyclical development in both the vertebrate and arthropod hosts. Nicolle advances the view that the typical spirochaete is incapable of multiplication or that it rarely divides, and that multiplication and consequent infectivity are entirely or largely confined to the minute forms which may coincide with the "coccoid bodies" of some authors, assuming that they are not ultramicroscopic.

"It has been proved that lice do not convey relapsing fever by their bites. As Nicolle and his colleagues have shown, persons may be bitten many thousands of times by infective lice with impunity. Infection takes place through the lice being crushed upon the skin which is commonly excoriated by the self-inflicted scratches of the individual harbouring the lice. Infective material may, moreover, be carried on the fingers to the nose or eye, and it has been demonstrated experimentally that the spirochaete is capable of invading the system through intact mucous membranes.

"The period of incubation, under experimental conditions, as observed in man and monkeys following infection through the excoriated skin or intact mucous membrane, is 6–8 days, when crushed lice in the infective stage are used. This corresponds with clinical experience. A single infective louse, crushed upon the excoriated skin, has produced relapsing fever. Persons have been experimentally infected by placing infected lice upon their persons without their knowledge. Happily for these subjects and for the experimenters who intentionally infected themselves, the course of the disease can be cut short by the arsenical treatment discovered by Ehrlich."

A. G. B.

MAYER (Martin). **Zur Uebertragung des Erregers des europäischen Rückfallfiebers (Febris recurrens) durch die Kleiderlaus. Bemerkungen zur gleichlautenden Arbeit von Prof. Jos. Koch in Nr. 34.** [Transmission of European Relapsing Fever by the Clothes Louse.] —*Deut. Med. Woch.* 1917. Sept. 27. Vol. 43. No. 39. p. 1231.

KOCH (Jos.). **Zur Uebertragung des Erregers des europäischen Rückfallfiebers durch die Kleiderlaus. Bemerkungen zu den Ausführungen des Herrn Prof. M. Mayer.**—*Ibid.* Nov. 1. No. 44. p. 1394.

M. Mayer writes from the Tropical Institute at Hamburg in criticism of J. KOCH's article summarised in this *Bulletin*, Vol. 10, p. 268. Koch shows ignorance of the work which has established the transmission by the clothes louse. The spirochaetes disappear from the louse's stomach 6–10 hours after the feed and reappear in the coelomic cavity at the end of the first week, at which time they are infective (North African form: NICOLLE, BLAIZOT & CONSEIL); or they can be seen from 24 hours to the eighth day in the coelomic cavity (TOYODA: European form). Examination of "wild" lice from infected patients yields no reliable information; experiments are needed on the lines of F. K. KLEINE's in sleeping sickness. Three of Koch's six figures show spermatozoa and not spirochaetes.

Koch replies without seriously disputing Mayer's contentions.

A. G. B.

VAN HOOF (L.). **Note préliminaire sur la fièvre récurrente parmi les troupes belges dans l'Est Africain Allemand.**—*Bull. Soc. Path. Exot.* 1917. Nov. Vol. 10. No. 9. pp. 786-791. With 4 charts.

The complications seen in more than 100 cases were—conjunctivitis; amaurosis with signs of retinitis; iritis and irido-cyclitis; headache resembling that of syphilis and responding to mercurial and arsenical treatment; meningism with stiffness of neck and Kernig's sign; progressive loss of intelligence and of memory; paresis of the lower limbs with spasticity and sometimes Argyll-Robertson's sign; recurrent myocarditis followed by death in every case; dysentery yielding to appropriate treatment, but not to emetine. [There is no indication of the relative frequency of these complications.] The author finds the leucocyte formula useful in diagnosis. There is an increase of basophiles, neutrophile myelocytes, young neutrophiles, metamyelocytes, and large mononuclears at the expense of the neutrophiles with segmented nuclei and the small lymphocytes. Some case histories are given. As to treatment, salvarsan and its substitutes, given when the temperature first rises, may cut short an attack but later, neither these nor antimony have much effect. Mercurial salts are then indicated; the author uses salicylate of mercury in aqueous solution by injection, with rapid and lasting benefit.

A. G. B.

i. ARMAND-DELILLE (P.), GASSIN & LEMAIRE (Henri). **Les principaux caractères de la fièvre récurrente observée à l'armée d'Orient.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1917. June 28. 3 Ser. Vol. 33. No. 21–22. pp. 778–780.

ii. PORTOCALIS. **Sur l'épidémie de fièvre récurrente observée récemment en Macédoine.**—*Ibid.* pp. 780–783.

i. The cases seen—apparently about fifty—were sporadic among the French troops, an epidemic having been averted by measures of "epouillage." The points noted were as follows:—

1. The disease was benign; one death only occurred.
2. The onset was abrupt.
3. With the disease established there were always sharp pains in the lower limbs.
4. The liver was always palpable; in 30 per cent. of cases there was jaundice.
5. The spleen was rarely much enlarged.
6. In some cases there was not only severe headache but Kernig's sign and lymphocytosis of the cerebro-spinal fluid.
7. After the first crisis, headache, subicterus, and pain often persisted; there was never a period of euphory.
8. There was generally not more than one relapse; a second was seen in 10 per cent. of cases.
9. The symptoms of the relapse were those of the first attack.
10. The only complications were haemorrhagic—subconjunctival, epistaxis, melaena.
11. The spirochaete was found in all the cases, never during the apyretic intervals and often not during the first three days of fever.

12. With the crisis, which always ended in hypothermia, there was a lowering of both maximal and minimal tension, whereas in malaria the minimal only is lowered.

13. This disease and malaria are often associated. The spleen is then tender and often enlarged.

ii. There were about 800 cases among the Greek troops and many among the civil population, to whom it was introduced during the Balkan Wars. Portocalis notes as symptoms of cardinal importance, the musculo-articular pains, the insomnia and the lucidity of mind present throughout. In some of his cases symptoms of meningeal reaction such as Kernig's sign were present, but never any change in the cerebro-spinal fluid; in no instance were spirochaetes found there. Epistaxis was sometimes so free as to necessitate plugging of the nares. The urine always contained true albumin and nucleo-albumin precipitable by acetic acid, very rarely casts and red blood cells. The primary attack lasted 5–7 days, the interval which followed 8–10 days, the relapse 3–4 days. One attack only was observed in 14 per cent. of cases. Owing to the occurrence of atypical forms the use of the microscope is essential. Two nstances of death were met with, both due to suprarenal deficiency. Thanks to measures taken relapsing fever is now almost extinct in Macedonia.

A. G. B.

Duchamp (C. J.). i. **Fièvre récurrente; paludisme consécutif.**—*Presse Méd.* 1917. Apr. 12. Vol. 25. No. 21. pp. 210–211 With 3 charts.
ii. **Contribution à la pathologie des Balkans. La fièvre récurrente des Serbes.**—*Bull. Acad. de Méd.* 1917. Mar. 13. 3 Ser. Vol. 77. Year 81. No. 11. pp. 372–373.

In these papers Duchamp calls attention to the fact that attacks of malaria may follow upon relapsing fever and simulate relapses of that disease. The temperature charts, which he gives as illustrations of this observation, were controlled by microscopical examination of the blood. Relying upon the charts alone, these spurious relapses might conceivably mislead a careless observer.

Duchamp states that latent malaria may be lit up for the first time in the above circumstances and the observation is of importance to those working in localities where relapsing fever is endemic.

R. P. Cockin.

Duchamp (J. C.). **Contribution à la Pathologie des Balkans. La fièvre spirochéto-plasmodique des Serbes.**—*Bull. Soc. Path. Exot.* 1917. Nov. Vol. 10. No. 9. pp. 827–834. With 3 charts.

By spirocheto-plasmodic fever of the Serbs the author means cases in which both parasites are found simultaneously and he seems to suggest that this is peculiar to the Balkans. He believes too hat it has not been previously reported. [It is common enough in Central Africa.] He describes in more or less detail six cases and g ves three charts. Laveran, in the discussion, said that he preferred the term associated relapsing fever and malaria and that the clinical types described were neither new nor peculiar to Serbia.

A. G. B.

KUELZ (L.). **Beiträge zur Pathologie und Therapie des Rückfallfiebers.** —*Arch. f. Schiffs- u. Trop.-Hyg.* 1917. June. Vol. 21. No. 11–12. pp. 181–188.

The author gives his impressions of relapsing fever as seen in German soldiers, in Turks on the Persian front, in Rumanians in Macedonia, Serbia and the Dobrudja. Whereas of the Germans there died only one man and of the Turks 8 per cent., the Rumanians—nearly all prisoners—died in numbers, in some formations up to 60 per cent. [but the respective figures are not given]. The so-called relapsing fever oedema was seen very rarely among the Germans, more commonly among the Turks, and in over one-third of the Rumanians. Intestinal complications—diarrhoea or dysentery with blood—occurred in the same relative proportions; many Rumanians died from this cause. Similarly, whereas a dose of 0·45 gm. neo-salvarsan was almost always effective with the Germans and Turks, in the case of the Rumanians failures were numerous, in the experience of one physician 35 per cent. A discussion follows of the causes of these differences. Opposing views are held as to the cause of the intestinal symptoms and the oedema, one school considering these to be symptoms of relapsing fever, the other of dietary deficiency. Külz shows that whereas the Germans had their usual food and the Turks in Persia nearly all that they were accustomed to, the Rumanians failed to get the maize and maize products which are to them what rice is to the Chinaman. It has moreover been proved, he says, that when these products are supplied the symptoms fail to appear; and oedema is not peculiar to relapsing fever cases but occurs also in Rumanians suffering from various other diseases. It is a symptom of lack of vitamines. The practical application is that in relapsing fever strict attention should be paid to the diet as well as to drug treatment. This experience also goes to show that with salvarsan it is not merely a matter of blood sterilisation, for if so the Rumanians should have done as well as the Germans.

With regard to transmission, whereas by strict measures against lice typhus could be and was stamped out, relapsing fever on more than one occasion continued to occur, so that the author concluded it was being spread by other means, and he suggests fleas.

Lastly a symptom is described by which the presence of relapsing fever can be detected early—the gait of the patient—which is characteristic from the first days or even hours. "The patient moves slowly and heavily with steps which seem to cleave to the ground . . he is insecure and seeks for support . . . it is as if the trunk were too heavy for the legs." This typical gait depends on affection of the calf muscles, and may also be seen in scurvy. Familiarity with it enables one to distinguish between commencing relapsing fever and commencing typhus, in which prostration is not seen till the third day. Ambulatory typhus is often seen, ambulatory relapsing fever never.

A. G. B.

GALLI-VALERIO (B.). **La bronchite à spirochètes ou Spirochaetiasis bronchialis (bronchite de Castellani).** — *Correspondenz-Blatt d. Schweiz. Aerzte.* 1917. Feb. 10. Vol. 47. No. 6. pp. 169–175. With 1 text-fig.

Galli-Valerio considers that the evidence goes to prove that a specific

bronchitic spirochaetosis exists. He is not, however, prepared to agree with FANTHAM that the causative agent is not a spirochaete of the mouth; but considers that the number of spirochaetes present in the sputum of infected patients points to specific infection by those organisms. The spread of the disease is brought about by means of infected sputum, and the writer quotes FANTHAM as stating that desiccated sputum is a fertile source of infection because of the relatively resistant coccoid forms of the parasite which are contained therein.

The incubation-period of the infection is given as from 24–30 hours. This is followed by a sharp attack of fever, in which the temperature rapidly mounts to 39°–40° C. Fits of coughing and abundant expectoration of yellowish, viscous sputum—which is occasionally nummular—are the usual symptoms of the disease. Percussion reveals no special features and auscultation only disseminated rales. Vocal resonance may be normal or increased. The examination of the blood demonstrates a diminution of haemoglobin and erythrocytes; whilst a manifest leucocytosis is present. The writer recommends that the condition be treated by injections of salvarsan or neo-salvarsan and that the patient be confined to bed. MACFIE is quoted as having administered creosote in these cases with good results.

R. P. C.

VON HOESSLIN (Heinrich). **Zur Klinik des Rückfallfiebers.**—*Münch. Med. Woch.* 1917. Aug. 14 & 21. Vol. 64. Nos. 33 & 34. pp. 1065–1068; 1106–1109. With 16 charts.

A long clinical paper based on the study, on the Eastern front, of 50 carefully observed cases and 170 seen once or more times. The symptoms are described in much detail with illustrative charts. A few points are selected here for mention. Oedema of the skin was not seen at all though some have regarded it as a frequent symptom; it is remarked that the patients had received a sufficient ration of bread and meat. Haemorrhages are regarded as characteristic, usually just before or during the crisis, and most commonly from the nose. All the patients complained of loss of taste. The pains in the limbs were regularly present, most often in the shin bones and the calves, which were usually tender to pressure. It was not always possible to find spirochaetes. [On several of the illustrative charts negative search is recorded.] The author suggests that there are vectors other than lice, without however bringing forward any evidence.

Several anomalous cases are described in which diagnosis was difficult, and in some of these it is noted that spirochaetes were not found; two cases ended fatally with lung complications; the charts show all types of fever, some quite irregular. [It is permissible to suggest the co-existence of malaria in some instances; it does not appear that its possible presence was considered.] Diagnosis is treated at a length which it would be tedious to follow. Owing to the pain in the bones, joints and muscles acute rheumatism has often been diagnosed; osteomyelitis has even been suspected. Other diseases discussed are—sciatica, bronchial catarrh and broncho-pneumonia, influenza, typhoid, spirochaetosis icterohaemorrhagica, dysentery, typhus (differentiated by the "Weil-Felix" reaction), five-day fever and malaria. The author has not had the 90–95 per cent. of successes

with salvarsan that other German authors claim and he points out that in more than half the cases the disease comes to an end after one relapse, and after a first attack as many as 13 per cent. of cases may recover spontaneously. A. G. B.

WIENER (E.). **Atypische Rekurrensfälle.**—*Arch. f. Schiffs- u. Trop-Hyg.* 1917. July-Aug. Vol. 21. No. 14–15. pp. 237–266. With 1 text-fig. & 39 charts.

The feature of this paper is the temperature charts wherein are indicated under the appropriate dates the finding of spirochaetes and of malarial parasites. The observations were made in autumn-spring 1916–17 in South Albania on 226 cases and the symptoms differed in nearly all from those usually attributed to the European type of relapsing fever. It is believed that the disease is endemic among the Albanians. The parasite was carefully studied and a series of figures illustrates the various forms it took; its length was 14·2–46μ, breadth 0·5μ, larger dimensions than those of other species; the number of curves was 4 to 12. The atypical cases are classed in two groups according as they were unmixed or complicated by some other affection, usually malaria, which was present in more than half the cases; in unmixed cases there were rarely more than one or two attacks. Sometimes the parasites were found with the spirochaetes, sometimes in preceding bouts of fever, sometimes in succeeding bouts, and naturally the charts have very different appearances. In a few cases spirochaetes were found in the fever-free intervals, especially it seems in under-nourished prisoners. Such cases are regarded as important as by means of them the disease might be introduced unawares.

Of the 226 there died 40, or 17·7 per cent. In the majority the autopsy showed dilatation of the heart, usually with degeneration of muscle and in some cases pin-head haemorrhages on the endocardum; in 25 per cent. there was terminal broncho-pneumonia, and in half the cases nephritis. Splenic enlargement, always present, could not be put to the account of relapsing fever only; the liver was invariably increased. Dysentery was present infrequently, chiefly among Rumanian prisoners. Changes in the brain and marrow are mentioned. The skin was yellow in 85 per cent. of cases, and in many there was icteric pigmentation of the liver and kidneys. In 10 per cent. on both sides of the trunk were haemorrhages from a hemp seed to a pin's head in size. Spirochaetes were invariably found in the spleen.

Arrhenal, tried in 83 cases, was useless. Neosalvarsan, 0·6 gm. intravenously, was successful except in two cases, the parasites disappearing 6–36 hours after the injection [the number of cases so treated is not stated]. Spirochaete containing blood was injected into rats, bats, hens, pigeons and ravens but only in one raven with success. The fate of the organisms was studied in the peritoneal cavity of the animals. In the raven spirochaetes were found in the bile a week after injection, when the bird succumbed. A. G. B.

PARROT (L.). **Du délire et des réactions psychomotrices dans la fièvre récurrente algérienne.**—*Bull. Soc. Path. Exot.* 1917. Oct. Vol. 10. No. 8. pp. 692–694.

DUMOLARD, AUBRY & TORRE (1914) recorded psychical symptoms, mental confusion usually with delirium, in 14 out of 17 relapsing fever

cases seen in Algeria [see this *Bulletin*, Vol. 5, p. 232] and more recently Porot (1917) noted delirium in four cases in that country. Parrot in an experience of 22 cases in various races and parts of Algeria finds acute delirium to be extremely rare; in all his patients the mind was clear throughout. In this opinion he is supported by Sergent and Foley [*Ann. Inst. Pasteur*, 1910, p. 339].

A. G. B.

Dudgeon (Leonard S.). **Examination of the Urine in Cases of Relapsing Fever occurring in Macedonia.**—*Lancet.* 1917. Dec. 1. pp. 823–825. With 1 text-fig.

The urine was examined in 100 cases and "the spirochaeta of relapsing fever" was met with in 27 out of 89 cases in which it was sought (30·3 per cent.); it is suggested that in such cases the urine may be infective. The urine in every case was centrifuged, and films were made of the deposit. For the spirochaetes the Levaditi process gave the best results. In the majority of cases albumin was present in the clear urine. Casts were usually found, especially hyaline and granular; epithelial and leucocyte casts were common; red cells and leucocytes were "very numerous on many occasions." Distinct improvement usually occurred in the urine after the intravenous injection of 0·25 gm. kharsivan, which was the routine treatment, not contra-indicated by albuminuria. The spirochaetes found in the blood "showed several coarse spiral turns and numerous figures of eight" and had a great affinity for the ordinary stains. In five instances spirochaetes were found in the urine before their discovery in the blood. Bile pigment was always absent and true jaundice was not noted. A short account is given of one autopsy.

In an addendum reference is made to papers by Stoddard and Patterson (*Brit. Med. Jl.*, Sept. 29). Stoddard found spirochaetes in 46 of 100 persons in the male urethrea without signs of relapsing fever and believes that these spirochaetes are a source of contamination in uncatheterised urines. Dudgeon notes however that it is the appearance in the urine of albumin, red cells and casts which is so important in relapsing fever. He considers that warm urine is the best flush for the urethra and has discarded catheters for bacteriological purposes.

Guinea-pigs inoculated with relapsing fever urine failed to become infected.

A. G. B.

i. Muehlens (P.). **Arsalytbehandlung, besonders beim Rückfallfieber.** [Treatment by Arsalyt in Relapsing Fever.]—*Deut. Med. Woch.* 1917. Sept. 13. Vol. 43. No. 37. pp. 1167–1168.

ii. Kostoff (K. H.). **Arsalytbehandlung beim Rückfallfieber.**—*Ibid.* pp. 1168–1169.

i. The action of arsalyt (dimethylamino-tetramino-arsenobenzol) was first tested in spirochaetosis by Giemsa (1913) [see this *Bulletin*, Vol. 2, p. 145]. Later the author with Gelhaar employed it in malaria [*loc. cit.*, Vol. 4, p. 292]. During the present war he has used it with success in Turkey and in Bulgaria for relapsing fever. The drug is

available in solution in ampoules and is injected intravenously by a technique which is detailed. Its action is at least equal to that of neo-salvarsan and the solution is always ready for use.

ii. Kostoff records its employment in 32 severe cases in doses of 0·4 to 0·5 gm.; 24 were in the first and 8 in the second attack. In 28 cases there was no further attack; the temperature came down in 4–20 hours and the spirochaetes disappeared. Similar results were obtained in 13 cases treated with neo-salvarsan, but the action on parasites and temperature was less swift.

A. G. B.

TOYODA (S.). [**Second Report on the Spirochaete causing Relapsing Fever in Manchuria.**]—*Saikingaku Zasshi.* (*Jl. Bacteriol.*). 1917. Apr. 20. No. 259. pp. 301–315. With 8 illustrations.

[From Review by R. G. MILLS].

For the determination of the method of fission a slide of the organism in the blood of a rat was made using osmic acid as the fixing solution, thus producing a stouter and more deeply stained body than is possible with alcohol. Both transverse and longitudinal division were seen. Preparations were made from cultures in the same manner by mixing equal parts of culture material with osmic acid solution, drying and then staining with Giemsa. The form of the organism was the same but the size was slightly smaller. No evidence of transverse fission was seen.

The animal inoculations of strains WANG and TAM were continued through more than 30 passages and the characteristics were unchanged. During the autumn of 1916 serum was obtained from 8 patients who had recovered from the infection and their agglutinative power tried on the strains Wang and Tam. Only 2 of the 8 affected the Wang strain and none influenced the latter. In all 9 cases were treated in 5 different mines of the Fushun coal company; 3 were of the Wang strain, 2 were related to the Tam and 4 were entirely different. It is evident therefore that there was no special strain, affecting any particular labourers' camp, which was being conveyed from one to another. [For summary of First Report, see this *Bulletin*, Vol. 10, p. 271.]

A. G. B.

MACFIE (J. W. Scott). i. **The Morphology of Certain Spirochaetes of Man and Other Animals.**—*Ann. Trop. Med. & Parasit.* 1916. Dec. 16. Vol. 10. No. 3. pp. 305–343. With 6 charts & 6 text-figs.

ii. **The Measurements of Length of** *Spirochaeta marchouxi.*—*Report of the Accra Laboratory for the Year 1916.* 1917. London: J. & A. Churchill. pp. 54–56. With 1 chart.

i. Only the contents of this paper can be indicated here. Spirochaetes from the vagina, bladder and throat of three natives of the Gold Coast are described and compared with known species. The vaginal spirochaete is described as *S. vaginalis*; its length was most commonly 7–10μ. The author discusses the means of distinguishing the smaller spirochaetes and concludes that length is the most

promising morphological character. He suggests drawing a large number by the aid of a camera lucida, measuring the drawings and plotting the results on a curve, as has been done with trypanosomes. He has followed this method in this paper.

ii. The author has made similar measurements of *S. marchouxi* the parasite of fowls, the only blood-inhabiting spirochaete available to him. He measured 300 and gives a chart of the result. The commonest lengths were between 9 and 11μ. As compared with the curves of the extra-vascular spirochaetes previously measured "the curve is longer and lower, the crest is less well marked and a smaller proportion of the parasites falls within the commonest length range. This difference is probably due to a delay in the separation of the daughter parasites in the blood."

A. G. B.

SANGIORGI (Giuseppe). i. **Sulla cultura *in vitro* degli spironemi dell' intestino umano.** [The Cultivation *in vitro* of the Spironemata of the Human Intestine.]—*Pathologica.* 1917. Feb. 15. Vol. 9. No. 198. pp. 61–62.

ii. **Sugli spironemi dell' intestino umano coltivati *in vitro*.**—*Ibid.* Sept. 1. No. 211. pp. 229–230. With 1 text-fig.

i. The author, having had occasion to examine the stools of a large number of soldiers for the presence of cholera bacilli, finds that Dunham's peptone-water makes a good culture medium for the Treponemata of the human bowel. It is, however, necessary that the medium should become anaerobic by the development of a superficial pellicle of bowel bacilli which will consume the oxygen in the solution. In taking samples for examination or transplantation, which should only be done once in every four days or so, the platinum loop should be passed down the side of the tube so as to disturb this pellicle as little as possible. The addition of small portions of rabbits' kidney, as recommended by TAROZZI, improves the medium.

ii. A short note describing involution-forms occurring in spirochaetes cultivated in peptone water. After 20 subcultures, during which the spirochaetes retained their normal appearance, involution-forms began to appear characterized by swelling, vacuolization, and reduction in the number of spirals. At each successive subculture the number of these involution-forms increased. Their appearance is shown in the illustration.

J. B. Nias.

NOGUCHI (Hideyo). i. *Spirochaeta icterohaemorrhagiae* **in American Wild Rats and its Relation to the Japanese and European Strains. First Paper.**—*Jl. Experim. Med.* 1917. May 1. Vol. 25. No 5. pp. 755–763.

ii. **Spirochaetes.**—*Jl. Lab. & Clin. Med.* 1917. Mar. & Apr. Vol. 2. Nos. 6 & 7. pp. 365–400; 472–499. With 3 charts.

i. In this paper Noguchi announces that he has been successful in isolating *Sp. icterohaemorrhagiae* from the kidneys of American wild rats. The rats were obtained from the vicinity of New York City and the strain of spirochaete isolated, when injected into guinea-pigs.

produced death within 9–12 days. The disease in these animals was characterised by "marked jaundice, cholemia, choluria and extensive haemorrhages into the various viscera."

"The morphology of the spirochaete corresponds with that of the Japanese and Belgian strains" with which Noguchi was able to compare it. It is described as "a closely wound, slender, cylindrical thread with gradually tapering ends, averaging 9μ by $0{\cdot}25\mu$" In cultures, "individuals of $3–4\mu$ or 20, 30 and even 40μ are met with." The number of coils is stated to be greater, in a given length, than in the case of any known spirochaete. "It is so closely wound that within 5μ there are 10 to 12 coils. Near the extremities, the coils become closer." The organism "is devoid of a terminal filament, such as is characteristic of a spironema or treponema, and is resistant to saponin (10 per cent.), unlike all other spirochaetes." Noguchi considers that it calls for a new genus and suggests the name *Leptospira*, because "of its fine and minute windings."

For diagnostic purposes, in human cases, the author recommends the following media :—

(a) 1 part rabbit serum, 3 parts Ringer solution (or 0·9 per cent. sodium chloride solution) and $\frac{1}{2}$ part of citrate rabbit plasma. The whole covered with a thin layer of sterile paraffin oil.

(b) The same as the above, except that $\frac{1}{2}$–1 part of neutral or slightly alkaline agar (2 per cent.) is added "while in a liquid state and quite hot (60°–65° C.) in order to get a uniform mixture of the agar."

These culture media are inoculated with the suspected blood "by introducing a quantity which is regarded as adequate in each instance." Growth takes place at 30°–37° C. and in 48–72 hours the spirochaetes may be found immediately below the surface (1·0–1·5 cm.). Noguchi states that "the organism is an obligatory aerobe, unable to grow in the absence of oxygen."

The American strain possesses an average degree of virulence, and animals immunised against the Japanese or Belgian strains are also resistant to the American. The author considers that the spirochaetes, designated in his paper as Japanese, Belgian and American, are probably identical.

ii. The second paper gives an exhaustive account of the spirochaetes. A bibliography is added to the article, and tables, giving the effects of various chemical and chemotherapeutic agents on the more important of these organisms, are incorporated in the text. This paper should be consulted by those who are interested in the recent work on this subject.

R. P. C.

JOBLING (James W.) & EGGSTEIN (A. A.). **The Wild Rats of the Southern States as Carriers of** *Spirochaeta icterohemorrhagiae.*— *Jl. Amer. Med. Assoc.* 1917. Nov. 24. Vol. 69. No. 21. p. 1787.

The authors observed a case of infectious jaundice at Nashville, Tennessee. They therefore examined a series of wild rats to ascertain whether they harboured *Spirochaeta icterohemorrhagiae.* One kidney was made into an emulsion in saline and injected into the peritoneal cavity of a guinea-pig; the other was examined microscopically. Of 100 rats examined 10 per cent. harboured this organism. The pigs

that developed the disease died after 12 or 14 days with jaundice and small haemorrhages in the subcutaneous tissue. Spirochaetes were found in the urine and kidneys. The authors show the importance of these observations in view of the number of Americans who are undergoing trench training.

A. G. B.

ARAGÃO (Henrique de Beaurepaire). **Sobre a presença do Espirochaeta icterohemorrhagiae nos ratos no Rio de Janeiro.** [On the Presence of *Spirochaeta icterohaemorrhagiae* in Rats in Rio de Janeiro.]—*Brazil Medico.* 1917. Sept. 29. Vol. 31. No. 39. pp. 329–330.

The occurrence of spirochaetosis icterohaemorrhagica in human beings has been noted in Brazil by McDOWELL and BENTES, and the author accordingly determined to look for the presence of its spirochaete in rats. Six wild rats (*Mus norvegicus*) were caught and examined, the kidneys of each one being rubbed up with sterile salt solution with a little sand so as to form an emulsion. Two cc. of the emulsion from each rat was then injected into the peritoneal cavity of a corresponding guinea-pig. Of the guinea-pigs so treated one died at the end of 10 days with typical symptoms, comprising jaundice, haemorrhagic foci in the lungs and stomach, epistaxis and oedema. Emulsions of the liver of this guinea-pig were then inoculated into six other guinea-pigs, all of which died with the same symptoms 8 to 10 days afterwards. In the organs of all these animals the typical spirochaete was found. The possibility of the occurrence of cases of spirochaetosis icterohaemorrhagica in man in Brazil is thus placed beyond a doubt.

J. B. N.

GABBI. **Spirochetosi ittero-albuminurica e febbri ricorrenti.** [Ictero-albuminuric Spirochaetosis and Recurrent Fever.]—*Malaria e Malat. d. Paesi Caldi.* 1917. Mar.–Apr. Vol. 8. No. 2. pp. 79–83.

A note drawing attention to the differences presented by the prevailing type of so-called ictero-haemorrhagic spirochaetosis on the Italian front, as compared with the disease described by WEIL and the Japanese observers. The disease, as seen on the Italian front, should be called *ictero-albuminuric* rather than *ictero-haemorrhagic*, and the nodosities on the spirochaetes described by HUEBENER and REITER are perhaps a point of difference not without importance. In view of the number of troops on the different fronts imported from Asia (Mahometan Tartars among the Russians, troops from Tonkin among the French, and so on), it seems to Gabbi quite probable that this so-called spirochaetosis is one or other of the tropical types of recurrent fever, of which there are so many. He instances seven such, occurring in Russia, Arabia, Persia, India (Chitral, Darjeeling), Tonkin, Beluchistan and Indo-China.

J. B. N.

PUGLISI-ALLEGRA (Stefano). **Contributo alla conoscenza dell' ittero infettivo della zona di guerra.** [The Infective Jaundice of the War Zone.]—*Malaria e Malat. d. Paesi Caldi.* 1917. May-Aug. Vol. 8. No. 3–4. pp. 113–118.

The author, from a study of 191 patients suffering from infective jaundice, found that they could be divided into two groups, of which

162 cases were of a benign type and resembled the jaundice which follows gastro-duodenal catarrh, while the remaining 29 only were of a severe type, as described by ITO and INADA. In the latter category there were two fatal cases. Amongst civilians in the same hospital there were also 200 cases, similarly divisible into two c asses, four-fifths being benign and one-fifth severe, among the latter being one fatal case. Positive results were only obtained with inoculation into guinea-pigs with the severe class. The infection among civilians seemed to begin with washerwomen who washed the clothes of the soldiers, and from them the disease was communicated to members of their families. The author thinks that the portal of entry was through the cracked hands of the washerwomen, enlargement of the epitrochlear glands at the elbow often being observed. In the case of members of their families it is surmised that the path of entry might be through the buccal mucous membrane, several instances of acute pharyngitis and labial herpes having been noticed in the early stages of the disease. For inoculation into guinea-pigs the urine of the patients was found to give better results than the blood. The stools are also certainly infective.

J. B. N.

McCREA (H. Moreland). **Trench Fever. Is this Condition a Spirochaetosis? With a Note on the Technique of Wassermann Reaction by** W. E. Carnegie DICKSON.—*Lancet.* 1917. May 26. p. 796.

A number of observers have noted the presence of a spirochaete in cases of trench fever. RIEMER is doubtful as to whether it is the actual cause of the disease but the writer considers that it is not unlikely that an organism of this nature may ultimately prove to be so.

He states that a positive Wassermann reaction was obtained [in which "the index was not very high"] in the case of 63 patients suffering from the chronic type of this disease; although only four of this number gave a history of syphilis.

The treatment consisted of weekly injections of galyl, administered intravenously, for a period of ten weeks. Three days after each galyl injection, grey oil was given intramuscularly.

More than half the cases treated in this way returned to the Army. During treatment two of the severer cases developed posterior root pains—similar to those occurring in syphilitic conditions.

The writer states that "after a very few intravenous injections the Wassermann test reacted negatively."

R. P. C.

HUEBENER (E.). **Weilsche Krankheit, Rückfallfieber, biliöses Typhoid.** *Deut. Med. Woch.* 1917. Oct. 11. Vol. 43. No. 41. pp. 1289–1291.

In this paper, which contains no original observations, the so-called Weil's disease* or spirochaetosis icterohaemorrhagica is compared with relapsing fever, the points of assimilation and of difference being taken up in turn. There follows an account of bilious typhoid described by

* WEIL himself believes that the cause of the disease described by him in 1886 has not yet been established (*Deut. Med. Woch.*, 1916, p. 130).

GRIESINGER in Cairo from observations made in 1850–52 and of a similar epidemic at Alexandria in 1888 recorded by KARTULIS. It is concluded that these were one and the same disease and that bilious typhoid is identical with Weil's disease.

[" Bilious typhoid " is described by SANDWITH in " The Medical Diseases of Egypt " under the heading Infectious Jaundice.]

A. G. B.

ITO (T.) & MATSUSAKI (H.). [*Spirochaeta icterohemorrhagiae*, **an Experimental Means of Infection.**]—*Saikingaku Zasshi.* (*Jl. Bacteriol.*). 1917. June 10. No. 261. p. 513.

[From Review by R. G. MILLS].

A guinea-pig whose heels had been cut in several places was placed in water heavily infected with these spirochaetes. This animal was in 48 hours afflicted with the disease whereas a control animal not so cut remained free from the disease.

A. G. B.

INADA. [**Serum Treatment of Infections by** *Spirochaeta icterohemorrhagiae.*]—*Tokyo Iji Shinshi.* (*Tokyo Med. News*). 1917. Apr. 28. No. 2021. pp. 24–25.

[From Review by R. G. MILLS].

The author summarizes the present knowledge as to the success of the serum treatment and makes a number of useful comments. Immune horse serum is used in 3 doses of 10 cc. each in the first 24 hours. There is very little preference for the intravenous method over the subcutaneous and in the severe cases there will probably be 35–40 per cent. mortality even with the best treatment. The temperature is not especially influenced by the injections and the icterus is only lessened when the injection is into the vein. The tendency to subcutaneous hemorrhage is lessened by this form of treatment but that beneath the mucous membranes is not affected. In fully half of he cases there is an irregular pulse and this condition is reduced to about 20 per cent. under treatment. Suppurative complications such as parotitis and impairment of vision are minimized. The reaction to the serum is slight, perhaps a little chilliness and occasionally a low fever.

A. G. B.

KANEKO (R.) & OKUDA (K.). [*Spirochaeta icterohemorrhagiae.* **Morphological Study during Serum Treatment.**]—*Chugai Iji.* (*Home & Foreign Med. News*). 1917. May 20. No. 8912. pp. 641–642.

[From Review by R. G. MILLS.]

During the study of cadavers of persons dead during the course of infectious jaundice it was determined that the spirochaetes are already dead in the liver, suprarenal capsules and other organs intimately related to the circulatory system. This was especially noticeable in the case of those who had died during the primary and secondary stages of the disease, at least suggesting that these would have died even without the use of the serum in treatment. The one exception to

this finding was in the kidney in which organ they were still alive, indicating that the future development of the treatment should be toward the finding of means to eliminate them from this organ also.

A. G. B.

YAMANO (W.), SANO (B.) & ASHIGAWA (B.). [*Spirochaeta icterohemorrhagiae* **Occurrence in Wild Rats in Chiba, Japan.**]—*Saikingaku Zasshi.* (*Jl. Bacteriol.*). 1917. Mar. 15. No. 258. pp. 282–283.

[From Review by R. G. MILLS].

The proportion of infection of wild rats in Siba was 48 per cent. Three cases of the disease were found in this same area. Thirty-seven per cent. of the rats examined had evidences of pulmonary hemorrhage and the inference is that a connection exists between the bleeding and the attack of the spirochaetes. The distribution of the organisms in the wild rats was found to be the same as in those in captivity artificially infected.

A. G. B.

ARCE (Julian) & RIBEYRO (Ramon E.). **Sobre un caso de espiroquetosis ictero-hemorrágica.** — *Cronica Med.* Lima. 1917. Oct. Vol. 34. No. 652. pp. 355–360. With 1 plate & 1 text-fig.

The patient was a Japanese, aged 33 years, who had lived in Peru since the year 1909. The clinical features of the case were of the usual type, except that the Widal reaction was positive, which was attributed to a previous attack of enteric fever. The patient made a good recovery. Spirochaetes were obtained in pure culture from a number of cuis [? Cavia sp.] inoculated with the patient's urine.

J. B. N.

MISCELLANEOUS.

ACCRA. **Report of the Accra Laboratory for the Year 1916.** By J. W. Scott MACFIE [D.Sc., M.A., M.B., Ch.B., D.T.M., Pathologist, Gold Coast]. –115 pp. With 1 map & 12 plates. 1917. London: J. & A. Churchill.

In this Report 29 pages are occupied by an account of routine examinations and 52 by papers on various subjects written by Dr. Macfie and Dr. A. INGRAM, which will be dealt with elsewhere. Under Blood Examinations it is noted that in 168, or 92·8 per cent. of the smears showing malaria parasites, these were *P. falciparum*, including *P. tenue* forms, as well as another atypical organism described by STEPHENS [see this *Bulletin*, Vol. 5, p. 351]. In the examinations of faeces on account of dysenteric symptoms *E. histolytica* was found 41 times including 9 in specimens from Europeans; no systematic search for carriers has yet been made in West Africa. *Blastocystis enterocola* was met with 15 times and the significance of this body is discussed [*loc. cit.* Vol. 10, pp. 258–9]; Macfie thinks this organism may sometimes be pathogenic. *Trichomonas intestinalis* seems to be a common parasite at Accra. A species of *Nocardia* found in faeces is described with a plate. Its fermentation reactions could not be tested and the culture died en route to England, so that the species remains uncertain. Tubercle bacilli were found in the sputum of 11 natives and spirochaetes in 6 [it is not stated whether these were natives suspected of tuberculosis]. In smears from a woman suffering from vaginitis *Trichomonas vaginalis* was found and in another patient similar flagellates but having all four flagella free; both flagellates are figured. The discovery of *Spirochaeta icterohaemorrhagiae* as the cause of epidemic jaundice and the resemblance of that disease to yellow fever having revived the idea that yellow fever itself may be a spirochaetosis, tissues from six cases of yellow fever (liver and kidney) were examined by the Levaditi method; all the tissues had been preserved in formalin; in none were spirochaetes found.

In 64 post-mortems 11 deaths were attributed to amoebic dysentery and three to ankylostomiasis; in these *Necator americanus* was found. Porocephalus larvae were seen in two instances. Of the amoebic dysentery cases some had been about till the day before death and some had the bowel ulcerated from the caecum to the rectum. The author points the moral that a course of emetine injections in only the beginning of treatment. In one case the disease had spread into the appendix; it is noted that appendicitis has been found only twice in 187 autopsies at Accra. The author criticises the suggestion that "*Stegomyia fasciata* relies chiefly, if not solely, upon the egg stage for the survival of the species during the dry period" (BACOT), as applied to the conditions in a town like Accra; he suggests that the resistant egg-stage was an adaptation acquired at an earlier period, when Stegomyia bred in rat-holes in trees.

The report is beautifully illustrated.

A. G. B.

BOMBAY. **Report of the Bombay Bacteriological Laboratory for the Years 1915 & 1916.** By Major W. Glen LISTON [C.I.E., M.D., D.P.H., I.M.S., Director Bombay Bacteriological Laboratory].—9 pp. 1917. Bombay: Printed at the Government Central Press. [Price 2*a*. or 2*d*.]

As the Bombay Bacteriological Laboratory is the laboratory where all anti-plague vaccine or India is made and plague investigat ons are carried out, and also the General Laboratory for the Province of Bombay, the Report is divided into two parts. Part I is dealt with elsewhere. In Part II the usual account is given of the routine work. Dr. SOPARKAR notwithstanding efforts has not yet met with the bovine type of tubercle in human beings in India. Experimental work goes to show that Indian calves are less susceptible to infection than English. Other activities are briefly described. The Laboratory has suppl ed vaccines, sera, etc., for military purposes, and in 1916 undertook the charge and organisation of the Pathological and Bacteriological work of the War Hospitals in Bombay. Owing to accumulation of convalescent typhoid and paratyphoid cases an Enteric Depot was opened at Parel. At the date of the Report 523 patients had been passed into it and 229 had been discharged. 6 of whom were para. A carriers, all faecal. The Report demonstrates the great activity of the Laboratory.

A. G. B.

COONOOR. **Pasteur Institute of Southern India, Coonoor. The Annual Report of the Director** [J. W. CORNWALL, Lieut.-Col. I.M.S.], **together with the Tenth Annual Report of the Central Committee of the Association.**—25 pp. 1917. Madras: Printed by the Superintendent, Government Press.

This Report deals with the period March 1916 to February 1917. The table that follows shows the results of treatment for 1916–17 and for 1907–1917.

TABLE I.

Period.	Total number of patients treated.	Died during treatment.	Died less than 15 days after the completion of treatment.	Died more than 15 days after the completion of treatment.	Percentage of failures (omitting columns 3 and 4).	Percentage of deaths, including column 4.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1916-17	1,707	4	5	15	·87	1·16
1907-17	9,887	21	33	73	·73	1·07

An attempt was made in this year to get more satisfactory statistics by circularising the authority who sent the patient, three months after completion of treatment. Of the 1,634 replies (no less than 96 per cent.) 1,543 persons were in good health, 20 had died of hydrophobia, 60 were not traceable and 11 had died of other causes, "a rate that might be expected amongst a mixed population." It is shown by tables that the biting animal is proved rabid by laboratory tests in about 17 per cent. of the patients treated but was not certified as rabid in more than 2 per cent.; however in Asiatics laboratory proof of rabies in the biting animal is of little importance, for 74 per cent. of deaths among those treated occurred in cases where "Animal was probably rabid, judging by the history given"; 9 per cent. of deaths occurred in cases where "Animal bit and ran away; nothing further known"; hence treatment cannot be refused to such persons. An attempt is made to assess the value of the treatment by tabulating for four years the number of patients treated and untreated, as far as figures for the latter group can be ascertained, with the respective mortality from hydrophobia. It works out as 2·39 for the treated, and 5·54 for the untreated, but possible errors are indicated. As has been stated before in these reports, every mad dog is not always in a condition to infect by biting, but when a mad dog is in an infective condition it will infect perhaps 40 per cent. of persons it bites.

From the eleven tables it is seen that the patients treated during the year were 1,546 natives and 161 Europeans and Eurasians, how many days after the bite treatment was instituted and the result in each group of five days, classification according to part of body bitten, classification by provinces and by castes, the biting animal, etc. The Report of the Central Committee and Balance Sheet follow.

A. G. B.

NIJLAND (A. H.). **Jaarverslag van de Landskoepokinrichting en het Instituut Pasteur te Weltevreden over het jaar 1916.** [Report of the Vaccination-Bureau and the Pasteur Institute at Weltevreden for 1916.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1917. Vol. 57. No. 4. pp. 465–489.

In the year 1916 enough vaccine was sent out from the vaccine department at Weltevreden to vaccinate 8,730,000 persons. The number of persons successfully vaccinated in the whole of the Dutch Indies in 1916 was 1,100,000, the percentage of successful cases being 98·1. At the Pasteur Institute 788 persons applied for treatment for rabies, of whom 472 were submitted to treatment. Out of this number 10 died, but only 2 of the deaths occurred after treatment had been completed = 0·41 per cent.

J. B. Nias.

CASTELLANI (Aldo). **Notes on Tropical Diseases met with in the Balcanic and Adriatic Zones.**—*Jl. Trop. Med. & Hyg.* 1917. July 16, Aug. 1 & 15, Sept. 1 & 15, Oct. 1. Vol. 20. Nos. 14, 15, 16, 17, 18 & 19. pp. 157–164; 170–174; 181–186; 198–202; 209–214; 219–223. With 2 plates, 15 charts & 4 figs.

The first part of this paper is concerned with malarial fever and has been noticed in the Section dealing with that disease. The diseases

considered in the second and third sections are, typhus, relapsing fever, pappataci fever, dengue, enterica and enteric-like fevers due to other organisms.

Typhus.—The rash, course and sequelae, prophylaxis.—There is generally a very marked flushing of the face, neck, and upper part of chest, and a subcuticular mottling of the lower part of chest and the abdomen—this during the second and third day. The same appearances are almost constant in pappataci fever. The true typhus rash, which appears on the fourth or fifth day, is described. It may be indistinguishable from that of enteric or may be absent. A petechial rash is common in the Balkans, due to innumerable flea bites; this when associated with malarial fever may deceive the novice. The average duration of fever was 14–18 days; in 80 per cent. of the cases it comes down by lysis. Typhus and relapsing fever frequently co-exist, not unnaturally seeing that both are conveyed by the louse. As regards prophylaxis the conclusions of the author's paper with JACKSON are given [see this *Bulletin*, Vol. 7, p. 192]: most of the experiments there described were, it may be remembered, concerned with the louse apart from its host.

Relapsing fever.—Was often seen with or after typhus or with malaria. At the onset it cannot, without the microscope, be diagnosed from typhus, malaria, or pappataci fever. Cutis marmorata and flushing of the face have here again been seen very frequently, and "occasionally a very fine rash composed of very small, roundish, delicate pinkish or red roseola spots on chest, abdomen and trunk, even in cases in which a mixed infection with typhus or enteric could be excluded." The mortality in Castellani's cases was less than 3 per cent. A combined treatment with salvarsan and tartar emetic gave the best results, the latter intravenously.

Pappataci fever.—Very common in the Balkans and Adriatic zone. *P. papatasii* is extremely numerous and bites by day as well as by night. Here again subcuticular mottling is seen on chest and abdomen. The flushing of the face and neck lasts long after the fever is over, 8, 12 or even 15 days. "As regards the appearance of the fauces, not only is there the usual congestion of tonsils and pharynx common in most acute fevers, but the mucosa of the soft palate presents a peculiar appearance—small hyperaemic roundish spots"—the eruption ceasing abruptly at the hard palate; this appearance is not peculiar to pappataci fever. The diagnosis between this fever and incipient typhus is difficult but aid is given by the fact that in the former there is leucopenia, in the latter none.

Dengue.—Castellani was shown cases labelled dengue in Macedonia, but considered them all to be pappataci fever. The features of each disease are given. He finds that, contrary to the text books, the enlargement of some lymphatic glands is comparatively frequent in dengue and may be considered to be one of the common features of the disease. They may be tender on pressure and may remain enlarged for some weeks. Gland juice injected into healthy persons will reproduce the disease (two positive out of three). He has known several cases of relapse. As a seque a polyarthritis with swelling of joints is rare but very troublesome.

Enteric fevers.—The three well recognized types are common; two or even all three may occur together.

Enteric-like fevers.—These are classed under six headings according to the biochemical reactions of the respective organisms. A table of the Cultural Reactions of Certain Aerobic Non-Spore Producing Intestinal Bacilli gives 28 reactions—mostly with sugars—of no less than 70 micro-organisms, 33 of which have been described by the author.

Castellani has seen two cases of "*Malta*" *fever* in Macedonia, and one of *kala azar* in a child in Macedonia.

The fourth section is concerned with fevers of various origin, jaundice and several kinds of dysentery and diarrhoea.

Quartan fever of non-malarial origin.—This has been seen by Castellani in Ceylon and he has met with two cases in Europe. The temperature chart (an example is given) is typical of malarial quartan, but the spleen is not enlarged, no parasites can be found, and quinine is useless. In one instance the fever lasted four months.

Rat-bite fever and *trench fever* were met with, as well as *low intermittent* and *high intermittent non-malarial fever*; in the latter the only treatment of any use is change of air; the case of a Serbian boy is detailed.

Types of jaundice.—The most common was *camp jaundice* which was met with in its severe and in its mild form. Each is attributed to spirochaetes, and the author thinks that the mild type has nothing to do with paratyphoid [see this *Bulletin*, Vol. 8, p. 73]. The pre-jaundice period in this form may be very long and is occupied by aches and pains with a normal or slightly raised temperature. Other forms of jaundice are of malarial origin; of paratyphoid origin; the icteric type of relapsing fever, the "bilious typhus" of old authors, which is generally very severe; and splenomegalic jaundice seen in young people in Serbia between 18 and 24.

Beriberi (two cases), *pellagra* and *blackwater fever* (one case) were met with.

Dysenteries.—*Bacterial dysentery* is very common in the Balkan Zone, the amoebic form less so. Shiga-Kruse, Flexner, Hiss and intermediate types were seen. Castellani calls attention to the choleraic type, which has caused much difficulty in diagnosis; in Ceylon it is called "serous diarrhoea." He lays stress on starting the treatment of bacterial dysentery with a purgative, castor oil or sulphate of magnesia. Two sequelae often noted were parotitis and polyarthritis He gives directions how to obtain a dysentery vaccine with no severe local and general action. As to *amoebic dysentery* he considers emetine a very safe drug but one which does not always achieve complete sterilisation.

Flagellate diarrhoea is far from being rare in the Balkans and Adriatic Zone. The flagellates found are *Lamblia intestinalis, Trichomonas hominis, Cercomonas hominis, Tetramitus mesnili*, less commonly a *Prowazekia* near to *asiatica* Castellani & Chalmers. Flagellates were found in the stools of 15 per cent. of healthy persons in the Balkans. Castellani thinks that when present in large numbers they cause diarrhoea, Lamblia being more pathogenic than the others. He gives methylene blue, 1–3 grains, by the mouth and also by intestinal irrigation; the drug "had no action on Lamblia infections." *Balantidial diarrhoea* was seen and *coccidiosis* is comparatively common.

Of *cholera* there was very little; in a case of supposed cholera *V. paracholerae*, identical with a Ceylon strain, was found. Choleraic

diarrhoea was caused by (1) food poisoning (*B. aertryke*), (2) bacteria of the dysentery group and (3) malaria. A typical case of *sprue* was seen in a woman at Skoplje.

The fifth instalment treats of helminth infections, broncho-spirochaetosis and broncho-mycosis [see this *Bulletin*, Vol. 10, p. 306], and diseases of the uro-genital organs.

Ancylostoma duodenale was seen in two boys at Skoplje, but not in soldiers. A case of anguillulosis due to *Strongyloides stercoralis* was seen. Taenia seemed to be "rather frequent." At Skoplje in a case of acute lymphadenitis with great enlargement of the left leg the night blood was found to contain embryos of *Filaria bancrofti*, and a typical case of *endemic funiculitis* diagnosed as strangulated hernia was seen in Macedonia.

In addition to broncho-spirochaetosis the author describes "*rhinopharyngitis spirochaetica*" in which the symptoms are those of severe coryza. Some cases are due to *S. bronchialis*, others to a spirochaete of different morphology.

Six varieties of non-gonorrhoeal urethritis are described, some of which however appear to have been met with in the Tropics and not in the Balkans or Adriatic Zone. These are, (1) traumatic mucous urethritis, (2) urethritis of hyphomycetic origin, (3) flagellate urethritis (Trichomonas, Cercomonas, Prowazekia), (4) amoebic urethritis, (5) spirochaetic urethritis, and (6) treponema urethritis.

The last instalment is concerned with skin diseases.

A. G .B.

MENDOZA-GUAZON (Maria Paz). **Study of the Anatomicopathologic Lesions in One Thousand Filipino Children under Five Years of Age.**—*Philippine Jl. Sci.* Sec. B. Trop. Med. 1917. Mar. Vol. 12. No. 2. pp. 51–84.

It is not possible in the space at disposal to give an adequate account of this interesting and fully documented paper. The following is extracted from the author's summary :—

"(1) Hemorrhage is the most frequent cause of death during the first few days of life and the brain and meninges are the favorite seats. Congenital anomalies are also responsible in many instances.

"(2) Of the children in this series 15·9 per cent. are infected with nematodes, and the frequency of infestation increases as age advances. The first variety that invades the alimentary tract of children and the one that infects the most is *Ascaris lumbricoides*. 95·5 per cent. This worm shows also a great migratory activity, which is probably favoured by an abnormal condition of the intestines.

"(3) The most frequent concomitant lesion of gastrointestinal disease is bronchopneumonia. In 193 cases the morbid condition was located in the colon in 68 and in both intestines in 54 cases. Amoebic dysentery is very rare in children, there being only one recorded case, and yet the lesions as described are not typical.

"(4) Asiatic cholera was nil during April and May [hot months], the incidence increasing with age and during epidemics. Newly born infants can be infected during their existence from a mother suffering with the disease.

"(5) In infants it is almost the rule for tuberculosis to become generalized rather than localized, the lungs being the commonest seat of lesion and the aërogenic type the most frequent mode of infection. The pericardium, oesophagus, duodenum, rectum, gall bladder, and reproductive system were not affected in this series even in a generalized acute and diffuse infection. Tuberculosis in this series has been found in 80 cases.

"(6) Infantile beriberi has been anatomically diagnosed in 150 cases. The literature shows that the disease is met only in infants born of, or nursed by, women on an exclusive rice diet. It is not seen in Manila in the children of foreigners that do not eat much rice. . . .

"This series shows that infantile beriberi is less prevalent during April, May, June, and July and that the age most affected is between 1 and 3 months. . . .

"(7) Pneumonia, lobar and lobular, has been met with in 21·6 per cent. of this series. If in this we include other diseases of the respiratory tract, we shall probably see that this tract is the most vulnerable place in young children.

"(8) Suppurative meningitis has been met with more frequently in the records than tuberculous meningitis and more so during the first two years of life.

"(9) Typhoid, malaria, and tumours are rare in children of this series.

"(10) The pathological study of this series includes only the causes of stillbirths, of death below the first six days of life, diseases of the gastro-intestinal tract, tuberculosis, pneumonias, meningitis, typhoid, malaria, and tumors."

The majority of the cases came from the Philippine General Hospital; they occupied a period of a little over five years. The causes are discussed of cases of still birth (52), and of death during the first six days of life (46 cases). 207 cases, excluding tuberculosis and cholera, showed anatomically some lesion in the alimentary tract. In many of these the diagnosis was "malnutrition." Cholera formed 103 cases, or 10·3 per cent., and it is believed the percentage would have been higher if cases diagnosed as cholera infantum and acute catarrhal enteritis had been bacteriologically examined; 18 patients were under 12 months old. "The clinical picture of cholera in children is often atypical" (McLaughlin). Attention is drawn to the "great frequency of the association of the disease with *Ascaris lumbricoides* and their migratory activity." Of 159 cases of infection with the four common nematode intestinal parasites Ascaris formed the great majority; there was only 1 case of cestode infection, with *Dipylidium caninum*. A table of "Age distribution of infection by worms" shows that Ascaris invades the alimentary tract at 3–4 months. In only 4 cases was Ancylostoma found and 4 Oxyuris, at 1½–2 and 2–3 years respectively. Infantile beriberi has been for many years at the head of the list of causes of infantile mortality in Manila. Of 150 cases recognised at autopsy 65 were diagnosed clinically; of the rest 25 were diagnosed convulsion and 25 acute bronchitis. The author discusses at some length the hypertrophy and dilatation of the right ventricle which, with other signs, was present in 132 cases. Disease of the respiratory tract came second in the causes of infantile mortality. Broncho-pneumonia, excluding tuberculosis, accounted for 180 cases or 18 per cent.; lobar pneumonia for 36 cases only. Typhoid was met with in only 3 cases, malaria in 6. [For a similar study of a much smaller series in Panama see this *Bulletin*, Vol. 9, p. 256.]

A. G. B.

Kermorgant. **Fonctionnement des postes médicaux des consulats français de Chine et du Siam.**—*Bull. Acad. de Méd.* 1917. Oct. 23. 3 Ser. Vol. 78. Year 81. No. 41. pp. 459–466.

Dispensaries and hospitals have existed for many years in association with French Consulates in China and Siam, at Yunnan Fou and

Montgtse in Yunnan Province, at Pakhoi in the Gulf of Tonkin, at Hoihao and Kiungchow on the Island of Hainan, at Canton and in Siam. An account is here given of the character of the posts and of the numbers of patients attended. Medical schools are attached to some of them. Yunnan (1,900 metres) is destined to be a sanatorium for the French in Indo-China.

A. G. B.

BUTLER (C. S.) & HAKANSSON (E. G.). **Some First Impressions of the Virgin Islands, Medical, Surgical, and Epidemiological.**—*U. S. Nav. Med. Bull.* 1917. Oct. Vol. 11. No. 4. pp. 465–475. With a map, 3 charts & 4 plates.

This attractively illustrated article gives an account of the islands which have been recently taken over by the United States from the Danes. They belong to the Leeward Islands group and extend from Porto Rico east and south. S. Thomas, S. John and S. Croix were transferred; the last named has an area of 84 square miles and a population of 14,000, chiefly negroes. S. John has most of the malaria —malignant tertian and quartan; the anopheline has not been identified. Hookworm infection is found in S. Croix but is not widespread. A conservative estimate of the extent of filariasis is 25 per cent. Pellagra is "quite common." Owing to lack of sanitation throughout the islands disease incidence and death rates are high. These are attributed to:—

"(a) Lax observance of the laws relating to marriage. To this is attributable the high rate of illegitimacy and of venereal disease and indirectly the high infant mortality. (b) Poor food conditions leading to undernourishment and pellagra. (c) Poor sewage disposal and defective water supplies, leading to numerous intestinal disorders: diarrhea, dysentery, and typhoid. (d) Long-continued encouragement to house breeding of mosquitoes, which has caused the high rate of filarial infection and high morbidity from this cause."

There is no laboratory in the group and the doctors are much overworked, but it appears that the islands should be healthy and prosperous. They have been managed from Denmark and insufficient funds have been available for sanitation.

A. G. B.

ESPINOSA-TAMAYO (L.). **Ueber die pathologische Geographie von Ekuador.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1917. Sept. Vol. 21. No. 17. pp. 285–291.

An abstract of a thesis. Among arthropods and ticks which are of frequent occurrence on the Coast are mentioned *Stegomyia fasciata*, *Cellia albimana* and *Sarcopsylla penetrans*; *Xenopsylla cheopis* and *Pulex dugesi* (from rats); *Ctenocephalus serraticeps* (from dogs); *Cimex rotundatus*; *Amblyomma cajennense*, *A. maculatum*, *Dermacentor nitens* (determination by NUTTALL).

Figures are given of the relative frequency of various helminths. Ova of *Ancylostoma duodenale* and *Necator americanus* were found in 179 cases out of 279 (64·1 per cent.); *Oxyuris vermicularis* was absent. Of flat worms *Taenia solium* and *Hymenolepis nana* are mentioned.

It is stated that malaria and amoebic dysentery are widespread on the coast; no figures of malarial parasites are given and the entamoeba was found only twice in the 279 cases. Yellow fever occurs chiefly in the State of Guayaquil; it has now "almost completely disappeared." Of bacterial diseases tuberculosis is the most lethal. Enteric fever is widespread and specially in Guayaquil and Quito. Many other diseases are mentioned but no figures are given to enable one to gauge their incidence. A disease called "chichismo" is caused by a drink named "chicha" produced by the fermentation of maize. It is said to resemble pellagra.

A. G. B.

MEDICAL MISSIONS IN INDIA. 1917. Oct. Vol. 23. No. 91. pp. 112-115.—**Symposium: Indigenous Drugs.**

Dr. J. M. MACPHAIL considers the unripe bael fruit [*Aegle marmelos.* N. O. Rutaceae] of real value in dysentery. The powdered seed of *Butea frondosa* [N. O. Leguminosae] is a substitute for santonin, which has gone up to a "fabulous price." "Plantain leaves may be utilised as a dressing for blistered surfaces, as a substitute for gutta-percha tissue in covering water-dressings, and as eye-shades." [Uganda missionaries could amplify this list.]

Dr. Caleb DAVIES finds *koorchi*, the bark of *Holarrhena antidysenterica* "of considerable value in chronic dysentery and diarrhoea." He uses locally prepared linseed oil in place of cod-liver oil and is very pleased with the results.

A. G. B.

GABBI (Umberto). **La sindrome delle malattie febbrili da virus filtrabile od ultramicroscopico (criptomorfo ?) e gli insegnamenti della Clinica.** [The Symptoms of the Fevers due to Filterable Viruses and their Classification for Clinical Purposes.]—*Malaria e Malat. d. Paesi Caldi.* 1917. Sept.-Dec. Vol. 8. No. 5-6. pp. 190–199. With 6 figs.

The author thinks that the term "cryptomorphic" is more suitable than filterable or ultra-microscopic for this class of pathogenic agents. Their principal points of distinction from a clinical point of view are summed up as follows, (1) limited febrile period, (2) termination by crisis, (3) double-peaked curve in some instances, (4) absence of splenic enlargement, (5) virus only communicable in the early stage of the disease, (6) relapses exceptional, (7) anatomical lesions not distinctive.

J. B. N.

SMITS (J. C. J. C.). v. **Syphilis en Gonorrhoe eener Javaansche koeliebevolking.** [Syphilis and Gonorrhoea in a Javanese Coolie Population.]—*Geneesk. Tijdschr. v. Nederl-Indië.* 1917. Vol. 57. Nos. 3 & 4. pp. 377–417; 431–447. With 4 charts.

Statistics as to the prevalence of venereal diseases amongst the coolie population (male and female) of the Sennah Rubber Company at Bila (Sumatra). All coolies are quarantined on arrival, and

examined generally for disease. In 1914, 269 men and 57 women gave the following figures for the presence of venereal disease :—

	Gonorrhoea.	Syphilis.
Men	31 ..	3
Women	33 ..	15

while, in 1915, for 253 men and 132 women the figures were :—

	Gonorrhoea.	Syphilis.
Men	24 ..	1
Women	50 ..	16

Most of the women are in fact professional prostitutes.

Since 1912 the author has followed the practice of detaining all cases of venereal disease in hospital until thoroughly cured, with the result of greatly reducing the amount of these diseases. The results are shown in tabular form at the end of the paper. Of 221 children born in hospital between November 1913 and December 1915, no less than 23, or 10·4 per cent., were still born.

J. B. N.

GABBI (Umberto). **Sulla porpora reumatica scorbutiforme nelle truppe e negli operai militarizzate alla fronte.** [A Scorbutiform Type of Rheumatic Purpura occurring among the Troops and Labourers in Military Employment on the Italian Front.]—*Malaria e Malat d. Paesi Caldi.* 1917. May-Aug. Vol. 8. No. 3–4. pp. 124–152. **With 1 coloured plate & 12 figs.**

Notes of 19 cases of a form of purpuric eruption on the legs, and sometimes also on the arms, accompanied by fever, swelling of the gums, enlargement of the spleen and gastric disturbances, which broke out somewhat suddenly amongst soldiers and civilians employed on military work on a portion of the Italian front. A similar outbreak had been recorded among the Austrian prisoners on the island of Asinari, and had been termed, by the Austrian surgeons in charge of them, scurvy. As this diagnosis seemed to reflect on the quality of the food supplied to the prisoners by the Italian Government, all of which was of the best quality, Professor Gabbi thinks it of importance to describe this scorbutiform malady more particularly. None of the Italian soldiers and civilians attacked had been fed to any extent on tinned food, and very few of the patients were in a bad state of general health. The cases all came from trenches in a high and cold mountain district, the men having to remain in the trenches without exercise for four days or more at a time. They slept in dugouts or in galleries cut in the rocks. The air temperature was low, especially at night. The cases all improved rapidly in hospital without any special treatment, the duration of their stay ranging from a few days to two months. In a few cases in which the blood was examined, the haemoglobin ranged from 50 to 70 per cent. of the normal, and the number of red cells per cubic millimetre from 2½ to 3 millions, the leucocyte counts being always normal. The author is therefore inclined to regard the condition as a form of rheumatic purpura, and not as true scurvy. The character of the eruption is illustrated by a good coloured plate.

J. B. N.

GIUGNI (Francesco). **La porpora emorragica scorbutiforme ad andamento epidemico in alcuni reparti di truppe combattenti.** [Epidemic Scorbutiform Haemorrhagic Purpura among Italian Troops.]—*Malaria e Malat. d. Paesi Caldi.* 1917. Sept.-Dec. Vol. 8. No. 5–6. pp. 161–177.

An account of a subfebrile form of purpura haemorrhagica with scorbutiform affection of the gums, prevailing among Italian troops serving at high altitudes in the Dolomite Alps. SICCARDI and GABBI have reported similar cases. In many instances the symptoms persisted notwithstanding the addition of vegetables and milk to the diet. The cases cropped up at intervals between June and December 1916 and then ceased. Blood cultures were always negative. Two guinea pigs were inoculated with blood from one case, with a negative result. The disease was never fatal, all the cases improving at once on removal to hospital. The duration of symptoms ranged from a fortnight to two or three months.

J. B. N.

IWANO (S.). **Ueber die chemische Natur des Scorpiongiftes.** [Japanese text.]—*Kyoto Igaku Zassi.* 1917. May. Vol. 14. No. 4. [Author's summary in German, p. 40.]

The author says that the chemical nature of the poison of scorpions is quite unknown. His experiments were made with scorpions from Manchuria the species of which are not stated. The results are thus summarised:—(1) The poison is a protein. (2) Two kinds can be distinguished, one soluble in water, the other in dilute acids and salt solution. (3) Two kinds of small crystals can be obtained and if, the poison is decomposed by trypsin, others like those of leucin and tyrosin. (4) The poison is destroyed by pepsin and trypsin and by potassium permanganate and calcium hypochlorite. (5) Lecithin and cholesterin in considerable quantity are also present in the scorpion poison.

A. G. B.

MACFIE (J. W. Scott). **A Note on the Occurrence of Leukaemia in the Natives of West Africa.**—*Report of the Accra Laboratory for the Year 1916.* 1917. London: J. & A. Churchill. pp. 39–42. With 1 chart.

The author has met with three cases of leukaemia on the West Coast since 1910, and considers that it is uncommon. One was of the myelogenous type, the other two lymphatic; two proved rapidly fatal. One only was seen more than once and a chart is given showing the variations in the numbers of blood corpuscles over a period of $4\frac{1}{2}$ months. A severe attack of malaria was followed by a reduction in the number of white as well as of red corpuscles, the white being reduced to less than a quarter of what they were before; the differential count, however, was only slightly changed. In this case 97–98 per cent. of the cells were lymphocytes.

A. G. B.

HESS (Alfred F.) & UNGER (Lester J.). **Prophylactic Therapy for Rickets in a Negro Community.**—*Jl. Amer. Med. Assoc.* 1917. Nov. 10. Vol. 69. No. 19. pp. 1583–1585.

Over 90 per cent. of the coloured babies in the neighbourhood of New York have rickets. In the district selected for the trial, in 1915 the infantile mortality was 314 per mille. Cod liver oil was given to about 50 babies between 4 months and 1 year. A table shows that when 54 ounces of oil was given over a period of 6 months 2 of 32 infants developed rickets, with smaller quantities (17 children) a larger proportion developed rickets and without oil, of 16 no less than 15. Whether the infants were breast or bottle fed made no marked difference. A four months' course appears to be insufficient. Details are furnished in six tables. The author says that olive oil cannot be substituted for cod liver oil. An animal oil is necessary, "probably from some glandular organ." No details are given of the food of the children or their mothers.

A. G. B.

DE LANGEN (C. D.) & SCHUT (H.). **Verdere waarnemingen omtrent het reduceerend vermogen van het bloed in de tropen.** [Further Observations on the Reducing Power of the Blood in the Tropics.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1917. Vol. 57. No. 2. pp. 260–276. With 9 charts.

In the present paper the authors continue their observations on the increased sugar-content of the blood in inhabitants of the tropics, as estimated by Bang's method [see this *Bulletin*, Vol. 9, p. 259]. They find that individuals living in a hill-station (Sindanglaja, 3,600 feet above sea-level) show figures intermediate between those found by them in individuals residing in Europe and in Batavia respectively, and conclude that this fact shows that the increased sugar-content of the blood is not due to the excessive carbo-hydrates of a tropical diet, as has been suggested by other researchers, but is a result of high external temperature solely.

The following table gives the average percentages found:—

	Holland.	Sindanglaja.	Batavia.
Rabbits	0·10 ..	0·135 ..	0·16
Guinea-pigs	0·115 ..	0·13 ..	0·145
Hens..	0·15 ..	0·185 ..	0·255
Ricebirds	— ..	0·17 ..	0·275
Europeans	0·09 ..	0·13 ..	0·165
Javanese	— ..	0·13 ..	0·155

J. B. N.

DE LANGEN (C. D.) & SCHUT (H.). **Over Glycosurie in de tropen en Low fever.** [On Glycosuria in the Tropics and Low Fever.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1917. Vol. 57. No. 3. pp. 330–341.

A paper discussing a form of glycosuria met with in the tropics, which the author denominates "*Diabetes innocens.*" The percentage of sugar in the urine is low, not exceeding 1 per cent., and the quantity

of urine not being greatly increased, the total amount of sugar passed in the 24 hours does not exceed 10–12 grammes. It is uninfluenced by dieting. The sugar content of the blood is lower than normal. Patients may seem quite well and show none of the normal symptoms of diabetes, the condition being often discovered by accident. It is suggested that the permeability of the renal epithelium is greater in tropical countries than in temperate ones, and that the condition known as "Low fever," characterized by a raised temperature and general malaise, is often ascribable to this form of glycosuria. Removal to a temperate climate, or to a hill station, will often arrest the symptom. Nine cases, some occuring in Europeans and others in natives, are quoted in illustration.

J. B. N.

PEACOCK (W. L.). **Note on the Value of Salvarsan in Relapsing Fever and Malaria.**—*Jl. Trop. Med. & Hyg.* 1917. Nov. 15. Vol. 20. No. 22. pp. 254–255.

The author at Mwanza on the Victoria Nyanza treated 12 cases of relapsing fever in Indians with salvarsan intravenously in single doses of 0·1 to 0·5 gm. In every case the parasites were found 6–15 days later and the reaction appears to have been severe. In two cases of syphilis subtertian parasites appeared in the blood 1–2 days after a salvarsan injection. [Salvarsan per se is known to have little or no effect on subtertian malaria.]

A. G. B.

MAYER (Martin). **Zur Symbiose von Spirochäten und fusiformen Bazillen bei geschwürigen Prozessen.** [The Symbiosis of Spirochaetes and Fusiform Bacilli in Suppurative Conditions.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1916. Oct. Vol. 20. No. 19. pp. 442–444.

The author refers to observations made by KEYSSELITZ and himself in 1908 from which it was concluded that the spirochaetes go in advance of the lesions caused by the fusiform bacilli and penetrate far into healthy tissue. The same disposition was found in ulcers of the gut of cats. These animals were infected with a mild strain of dysenteric amoebae. In the ulcers were frequently found few amoebae but masses of spirochaetes and fusiform bacilli, which were considered to be secondary invaders. In one instance the fusiform bacilli were found chiefly in necrotic crypts in thick layers close to the submucosa, whereas the spirochaetes had penetrated this and occupied the septa between the inner layer of muscle, as well as between the fibres.

A. G. B.

GANGULI (Satkari). **Infantile Biliary Cirrhosis.**—*Indian Med. Gaz.* 1917. Oct. Vol. 52. No. 10. pp. 361–363.

This disease, known as "infantile liver," is common in Bengal. It is "characterised by the permanent enlargement of the liver and spleen, persistent jaundice and abscence of ascites." Later in the paper ascites is given as a late symptom. It is also known as "Hanots' hypertrophic cirrhosis of the liver." It affects villages and towns in

all parts of India. The cause is unknown. It commences during dentition up to the age of two. Its pathological anatomy has been described by Lieut. Col. GIBBONS, I.M.S. [reference not given]. The onset is insidious or with dyspepsia. Later, fever is almost constant. The mortality ranges between 60 and 80 per cent. Considerable space is devoted to treatment, dietary and medicinal. The medicine recommended, somewhat apologetically, is calf urine, two drams to one ounce taken internally and used as a fomentation. "When it is bottled up and well labelled with a charming 'nomenclature' I doubt if any customer would object to its use."

[This is perhaps the disease briefly described on page 1,403 of the 2nd Edition of CASTELLANI & CHALMERS's "Manual."]

A. G. B.

GROTHUSEN. **Akute Entzündung des äusseren Gehörgangs in Ostafrika.** [Acute Inflammation of the Outer Ear Passage in East Africa.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1916. Feb. Vol. 20. No. 3. pp 56–57.

In the course of two years at Kilwa, the author saw many cases of acute inflammation of the external ear passage in man; during many years in the interior he saw no such cases. The affection occurs chiefly in the rainy, which is the hot, season. The ear becomes painful, the skin, especially of the external auditory canal, much swollen; the canal is narrowed so that the drum is often not visible; there is no secretion; pressure on the tragus towards the canal is very painful. The corresponding lymphatic gland is swollen and painful. Later there is pruritus. No furuncle forms. The condition lasts 10–14 days.

A. G. B.

SULDEY (E. W.). **Epidémie de méningite cérébro-spinale à méningocoques (?) à Madagascar.**—*Bull. Soc. Path. Exot.* 1917. Oct. Vol. 10. No. 8. pp. 689–692.

Epidemic cerebro-spinal meningitis has not hitherto been reported from Madagascar. The disease appeared suddenly in July, 1916, in Creoles who had returned from France, there being four cases, three of which were fatal. In the purulent cerebro-spinal fluid an intracellular diplococcus was found, not staining with Gram and having the morphological characters of Weichselbaum's micrococcus. It could not, for want of facilities, be isolated nor tested with agglutinating serum. The 500 men concerned were isolated at Cape Diego and were regarded as all infected. For six days all were subjected three times a day to disinfection of the nasal fossa, mouth cavity, naso-pharynx, and pharynx by gargling, inhalation, and painting of the mucous membrane; details are given. A fortnight later all the men were fit and smears from 12 who had slight pharyngitis showed no organisms of meningococcic type. The 500 men furnished a contingent of 300 which was embarked for Marseilles. In spite of bad conditions on the voyage and the change of climate no case of meningitis nor symptoms suggestive of it appeared. Since then the disease has broken out among the Malagasies.

A. G. B.

STOCKMAN (Ralph). i. **Lathyrism.**—*Edinburgh Med. Jl.* 1917. Nov. New Ser. Vol. 19. No. 5. pp. 277–296. With 1 plate.
ii. **Lathyrism in Man.**—*Ibid.* pp. 297–307. With 2 plates.

These two articles do not appear to add much to knowledge, but as they give a much fuller account of the subject than is to be found in text books,* and hardly accessible reports are extracted in the second paper, they form a valuable compendium of the disease. It has been known since the days of HIPPOCRATES and was prevalent, especially in times of famine, in Northern India when the natives lived on an exclusive diet of certain species of Lathyrus or vetch. The effect of such feeding in various species of animals is described and the protocols of 11 experiments on monkeys are given, with others on rabbits, pigeons, ducks, a pig and a sheep, performed by the author. No histological changes could be detected in the muscles or nervous system of poisoned monkeys. An attempt was made to extract the poisonous principle, which is an alkaloid. The author says that "the whole subject requires to be thoroughly reinvestigated." A list of 39 references is appended.

A. G. B.

CHALMERS (Albert J.) & ARCHIBALD (R. G.). **Generalized Vaccinia in Sudan Natives.**—*Jl. Trop. Med. & Hyg.* 1917. Oct. 15. Vol. 20. No. 20. pp. 236–237. With 1 plate.

In the course of some 50,000 vaccinations of natives with calf lymph several cases of generalised vaccinia occurred. Two such are figured. In the first, a child of 5, the eruption appeared 12 days after vaccination and lasted 9 days, the only symptom being slight itching. The rash was vesicular and not umbilicated and was seen chiefly on the back. The second case was an elderly man. The rash appeared 22 days after vaccination, and required some 6 days to reach its height, the scabs being thrown off 8 days later. This patient had fever. The papules, which were more profuse and occupied a larger area, became vesicles and then umbilicated pustules; the scabs, the authors think, will leave depressed scars. No serious symptoms were heard of in any case. Personal idiosyncracy is considered to be the cause. Reference is made to a good paper on this subject by HILL & ROSS (*Jl. Hygiene*, 1910, Vol. 10, p. 137).

A. G. B.

DE RUYTER (J.). **Presbyopie bij Inlanders.** [Presbyopia in Natives (of the Dutch East Indies).]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1917. Vol. 57. No. 1. pp. 43–47.

From an examination of the eyes of natives the author comes to the conclusion that presbyopia progresses more rapidly in them, after the age of 40 years, than in Europeans. According to LANDOLT, presbyopia in Europeans may be reckoned as advancing from 0·25 D. at 40 years of age to 1·3 D. at 48. The examination of the eyes of 17 otherwise healthy natives, however, showed an average of nearly double this figure, namely, from 0·5 to 2·0 D., within the limit of 40 and 48 years. The author thinks the point worthy of further investigation.

J. B. N.

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* CASTELLANI & CHALMERS give a good account, exceeding two pages of their text-book.

VOGT (Volrath). **A Case of Arisaema Poisoning.**—*China Med. Jl.* 1917. Sept. Vol. 31. No. 5. pp. 392–396. With 1 text-fig.

A Chinese woman ate of the tuber of a species of Arisaema which is figured. She was immediately brought to hospital where the stomach was washed out, after which she went home. A few hours later she became stuporous with distended abdomen and paresis of limbs, but the next day had recovered. The plant is said to have been identified by a Professor of Pharmacology as belonging to "the family of Arisaema." Its inflorescence resembles that of *Arum maculatum*, the lords and ladies of English hedgerows, to which genus it is allied. It is noted that only a small piece was swallowed and that treatment followed in 10 minutes; hence it must be considered very poisonous.

A. G. B.

WRIGHT (Louis T.). **The Schick Test, with Especial Reference to the Negro.**—*Jl. Infect. Dis.* 1917. Sept. Vol. 21. No. 3. pp. 265–268.

The Schick test, described in 1913, is defined as "a simple intracutaneous test that indicates whether or not the person tested possesses a natural antitoxic immunity to diphtheria." The practical value of the test has been generally established. The reaction is characterised by "a circumscribed area of redness and slight infiltration which measures from 1·0–2·5 cm. in diameter. It persists for 7 to 10 days and on fading shows superficial scaling and a persistent brown pigmentation." Scaling and pigmentation are characteristic of all positive reactions. The author, who was enabled to study the reaction in 207 coloured persons, sought to discover what colour the pigmentation would take on very dark or black skins, and the degree of natural immunity in negroes. Of 210 persons tested 86, or 40·9 per cent., reacted positively. On the dark skin the scales were white or grayish in colour, and the darker the skin the darker the pigmentation. It is concluded that the reaction is as clear cut in negroes as in whites and that adult negroes possess about the same degree of immunity as adult whites.

A. G. B.

DE GRANADA (S. H.). **Bijdrage tot de aetiologie der pneumonie.** [A Contribution to the Study of Pneumonia.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1916. Vol. 56. No. 7. pp. 1000–1012. With 2 diagrams.

Statistics of the incidence of croupous pneumonia amongst the workers in a coal mine, where it caused by far the largest item in the annual mortality. Part of the labourers were paid, while the remainder were convicts. The lodging provided varied with the class, and the incidence of pneumonia varied in the same proportion. Of the paid labourers the married ones lived in houses, and the remainder in sheds. The incidence of pneumonia was as follows:—

	Cases.	Number.	Percentage.
Married people	4	263	1·5
Unmarried paid workers	37	1,278	3·1
Convicts..	196	2,657	7·4

Elevations are given of the different classes of building provided.

J. B. N.

BAUJEAN (R.). **Notes sur quelques manifestations de la Pneumococcie chez les Tirailleurs des Camps de Fréjus et Saint-Raphaël.**—*Bull. Soc. Path. Exot.* 1917. Nov. Vol. 10. No. 9. pp. 816–827.

Pneumococcus infection, and then tuberculosis, is the chief cause of admission to hospital and death at these camps in the South of France, and chiefly among the Senegalese, Malagasies and Somalis. The usual manifestations are pneumonia, broncho-pneumonia, pulmonary congestion and bronchitis, with the frequent implication of the pleura and pericardium but never the peritoneum. Other forms are here described.

Pneumococcus infection of the skin—six cases. In four the face was affected and the lesions suggested erysipelas; in the other two there was a generalised eruption. Extreme swelling of the face was followed by the eruption, in crops, of small bullae; the enclosed fluid swarmed with pneumococci. After a few days they dried up and crusts separated; small abscesses sometimes followed. There was continued fever, 39°–40° C., headache and delirium. In one case the phlyctenules covered the whole body, resulting in an acute pneumococcic pemphigus which ended fatally. Pure cultures were obtained from the phylyctenules. Details of the six cases are given, one in a Frenchman. The author has seen also a pneumococcic panophthalmia.

Pneumococcus infection of the meninges.—Of 52 cases of acute cerebro-spinal meningitis seen at these camps 30 were due to the meningococcus or varieties thereof, and 22 to the pneumococcus. The cerebro-spinal fluid showed polynucleosis and pneumococci. Pus was often found in the frontal and maxillary sinuses. In six cases the pneumococcus was found in the blood on the day of admission. The development of the disease was always rapid and the issue always fatal. Four cases are described; they show that in the cerebro-spinal fluid there is no correlation between cellular reaction and the number of microbes.

Pneumococcus septicaemia.—In 14 pneumonics taken as they came haemoculture at the onset showed pneumococci in the blood in five. Ten pneumonics without septicaemia recovered; of five with, four died. Two cases in which the septicaemia was primary are given.

A. G. B.

JOUIN (A.). **De la gravité de la Pneumonie chez les Noirs, les Malgaches et de la fréquence de la mort subite au cours de cette affection par dilatation cardiaque aiguë consécutive à une paralysie des centres nerveux du cœur.**—*Bull. Soc. Path. Exot.* 1917. Nov. Vol. 10. No. 9. pp. 774–777.

The author is a medical officer of native workmen (*ouvriers coloniaux*) at Toulon. He has noted the severity of pneumonia among the blacks, especially the Malagasies, and the frequency of sudden death on the second or third day. The lesions in the lung were then at an early stage; most of the lung parenchyma floated in water; there were however always lesions of the pericardium, adhesion or serofibrinous effusion, and degeneration of the heart muscle. The liver and kidneys appeared normal. The author thinks death is attributable to the action of the pneumococcic toxins on the heart, causing neuritis

and paralysis of muscle. He uses cardiac tonics from the beginning and, in particular, hypodermic injection of sterilised camphorated oil 10–12 cc. daily, with the addition of spartein, and the results have been excellent. He notes that arterial hypotension is the rule, and that endocarditis is rare.

A. G. B.

MOSES (Arthur). **Fixação de complemento na blastomicose.** [Complement-Fixation in Blastomycosis.]—*Mem. Inst. Oswaldo Cruz.* 1916. Vol. 8. No. 2. pp. 68–70.

The author describes the methods adopted by WIDAL and ABRAMI, MALVOZ and RICKETTS for obtaining complement-fixation in cases of blastomycosis.

The cultures used for preparing the antigen should be at least six months old, and grown upon maltose or glucose agar. The organisms are rubbed up thoroughly in a sterilized mortar with physiological solution to form an emulsion, which is then shaken at intervals for 24 hours with porcelain balls in a glass vessel, and finally filtered through paper or a Berkefeld filter. One half per cent. of carbolic acid is added for preservation. The emulsion of organisms used in making the complement test is prepared in a similar way, without trituration and filtering, and is then diluted until it is without action on guinea-pigs' serum. The author obtained a positive result as regards deviation of complement in 8 out of 10 cases of blastomycosis in man.

J. B. N.

LOW (George C.). **Emetine Diarrhoea.**—*Brit. Med. Jl.* 1917. Oct. 13. p. 484.

In reference to a paper by KILGORE & LIU [see this *Bulletin*, Vol. 10, p. 309] Dr. Low points out that in November 1915 he drew attention to the fact that emetine hydrochloride given hypodermically produced diarrhoea in many instances just as ipecacuanha in large doses used to do. He considers this a beneficent action, not a sign of intoxication; the like occurs with emetine bismuth iodide. The liquid stools are easily distinguished from the dysenteric. He has not seen peripheral neuritis.

A. G. B.

MATTEI (Charles). **Notes sur l'emploi du Chlorhydrate d'émétine.**—*Paris Méd.* 1917. Oct. 13. Vol. 7. No. 41. pp. 295–299.

After a reference to emetine diarrhoea the author gives the case of a soldier with amoebiasis and liver abscess, which caused a swelling in the epigastrium of the size of a large orange. After a fortnight's treatment (1 gm. of emetine) the swelling disappeared. Later, the patient died of pneumonia and the autopsy showed a collection of creamy semi-solid pus surrounded by a fibrous shell of the size of a walnut. His emetine results have been better with ampoules prepared in 1916 than those of 1914; i.e., old solutions are inferior to recent. Abnormal

symptoms noted during the course of subcutaneous injections of emetine (220 patients) were: hypotension and feebleness of the heart's action (9 cases); the cardiac failure might be rapid or gradual; mucous expectoration, inspiratory spasm like a prolonged hiccough (3 cases), paresis of muscles especially of the neck (1 case); in two instances feebleness of legs with difficulty in swallowing; oliguria in most cases with increase of Ambard's coefficient. Of the 220 patients 204 received a total amount of less than 1 gm.; two only had transient toxic symptoms. The 16 others received 1·06 gm. to 1·50 gm. in 30–35 days; 7 had serious toxic symptoms at the end, or 5 or 6 days after cessation of treatment. The author agrees with DALIMIER that in dosage beyond 1 gm. emetine hydrochloride is a dangerous drug [see this *Bulletin*, Vol. 9, pp. 379–80].

A. G. B.

MATTEI (Ch.) & RIBON (E.). **Note sur l'élimination urinaire du chlorhydrate d'émétine chez l'homme.**—*C. R. Soc. Biol.* 1917. Nov. 10. Vol. 80. No. 17. pp. 830–831.

The authors found that in amoebic dysentery emetine appears in the urine usually 20 minutes, sometimes 40 to 50 minutes, after a subcutaneous injection. During treatment the drug is eliminated in increasing quantities, representing however only one sixth to one tenth of the quantity introduced. After treatment, periods of elimination alternate with periods in which little or none is found in the urine; this discontinuous excretion has lasted from 5 to 8½ weeks. Patients who had received 0·48 gm. in 8 days were still excreting at the end of 60; it is noted that measured by Ambard's coefficient their renal function was below normal. These data, as the authors say, throw light on the accumulation of emetine.

A. G. B.

PAVA (Carlos M.). **Emetina. Consideraciones sobre algunas de sus verdaderas indicaciones.** [Remarks upon the Proper Employment of Emetine.]—*Repertorio de Med. y Cirug.* 1917. July. Vol. 8. No. 10. (No. 94). pp. 465–473.

Besides employing emetine in the treatment of amoebic dysentery after the method of ROGERS, the author has found the drug useful also in the treatment of muco-membranous colitis, in a dose of 2 to 3 centigrammes per diem, though not more so than the daily use of a purgative dose of 35 grammes of sulphate of soda. He has also found it useful in simple congestion of the liver of gastro-intestinal origin, in doses of 1 to 2 centigrammes, presumably from its favourable action on the secretion of bile. Again, in the haemoptysis of phthisis the author has found emetine very useful, a first dose of 5 centigrammes being given, with a second one of 3 centigrammes on the same day if the haemoptysis does not subside, and on each succeeding day the dose of 3 centigrammes may be repeated if necessary. [Concurrently, however, the author gives opium internally in a daily dose of 5 to 10

centigrammes, which rather detracts from the scientific value of the observation.] The author has found emetine useless in the treatment of typhoid fever, and also in two cases of pyorrhoea alveolaris.

J. B. N.

SWEET (E. M.). **The Arneth Index in Eastern Australia.**—*Med. Jl. Australia.* 1917. Sept. 22. Vol. 2. No. 12. 4th Year. pp. 243–244.

The author refers to the observations of BREINL and PRIESTLEY, who found a much increased Arneth index in children from the Northern Territory, which they regarded as an outcome of climatic conditions in the tropics as such. Sweet estimated the Arneth index in 300 Eastern Australian school children, from North Queensland (106), South Queensland (67) and Melbourne (100), and found that a high index "is very regularly present in healthy children over the whole of the coastal area of Eastern Australia," a finding which is "opposed to the view that the high index in Queensland is due to disease or to tropical climatic conditions." Possible factors were, age, occupation, race, external temperature, season, latitude and febrile states; and observations were made on small numbers of persons in various groups chosen to gauge the influence of each of these factors. As far as these figures go age, provided it is over seven, is without effect. Occupation likewise (observations on 22 soldiers and 15 students at Melbourne). Two groups of healthy Thursday Island children, one white, one black, showed no difference. No marked difference was found in Melbourne in specimens taken in January and August, the variation of temperature being 16·6° F.; nor did the wet bulb temperature seem to matter. In five persons suffering from febrile diseases the index was raised. No factor apart from disease was found definitely to influence the Arneth index. "Owing to the apparent influence of external temperature on the Arneth index of animals it would appear that further research on the influence of the external temperature on the Arneth index of man is called for."

A. G. B.

MACFIE (J. W. Scott). **Arneth Counts in Ankylostomiasis and other Pathological Conditions.**—*Report of the Accra Laboratory for the Year 1916.* 1917. London: J. & A. Churchill. pp. 43–53. With 2 charts.

In view of the fact that there is an extreme shift to the left of the Arneth count in yellow fever, the diagnostic value of which it is important to appreciate correctly, the author is engaged in collecting Arneth counts in various pathological conditions in the tropics. In ankylostomiasis (23 cases examined) he finds there is a tendency to shift to the right where symptoms of the infection are present, but when malaria co-exists the shift to left characteristic of that infection is present. In a case of blackwater fever, in which a count was made just before and four times in the course of the (fatal) illness, the respective counts were 87, 88, 88, 83, 83; these counts were similar

to those obtained in malaria ; subtertian parasites were present at the first count. The counts in other pathological conditions are shown in the table.

TABLE IV.

Arneth Counts in Various Morbid Conditions.

No.	Disease.	Arneth classification per cent.					
		I.	II.	III.	IV.	V.	Index.
1.	Yellow fever, 5th day ..	49·0	41·5	8·5	1·0	0·0	90·5
	,, ,, 12th ,, ..	17·5	37·5	37·0	8·0	0·0	55·0
2.	,, ,, 3rd ,, ..	55·5	38·0	6·5	0·0	0·0	93·5
3.	Pyrexia of uncertain origin..	64·0	35·0	1·0	0·0	0·0	99·0
4.	,, ,, ,, ..	83·0	17·0	0·0	0·0	0·0	100·0
5.	,, ,, ,, ..	69·5	28·5	2·0	0·0	0·0	98·0
6.	Menstruation and malaria..	88·5	11·5	0·5	0·0	0·0	99 5
7.	Syphilitic iritis	2·0	27·0	50·0	20·0	1·0	29·0
8.	(?) Trichomoniasis	2·0	15·0	30·0	28·0	25·0	17·0

In the two yellow fever cases the extreme deflexion "enabled a diagnosis to be suggested early"; both were Europeans. The first "pyrexia of uncertain origin" might have been mild yellow fever, the two others were thought to be due to exposure to the sun but they also might have been yellow fever; all three were Europeans. The most profound shift to the right met with by Dr. Macfie was in the case of a native woman suffering from severe anaemia and diarrhoea who died a few days later: the faeces swarmed with *Trichomonas intestinalis.*

A. G. B.

GREIG (E. D. W.). **The 'Sprouting Capacity' of Grains issued as Rations to Troops.**—*Indian Jl. Med. Res.* 1917. Apr. Vol. 4. No. 4. pp. 818–823.

The investigations of Axel HOLST, confirmed by Miss CHICK, have shown that the antiscorbutic value of grains can be much increased by allowing them to sprout. Samples of crushed and uncrushed grains were obtained by the author, the former from an official source, and were sprouted on moistened blotting paper in Petri dishes, the proportion that sprouted being determined at definite intervals and its effect noted on the cooking of the grain. The protocols of several experiments are given. It was found that the crushing of lentils destroys, to a considerable extent, their capacity for sprouting; uncrushed grains are therefore to be preferred. From the point of view of cooking 24 hours germination appeared to be the optimum period. Certain grains supplied to troops sprouted more freely than others. On service the grains may be spread out between clean moist blankets.

A. G. B.

TERBURGH (J. T.). **De resultaten van het gescheiden vaccine-stelsel en van de systematische revaccinatie in de geneeskundige afdeeling Oost-Java gedurende de jaren 1912 tot en met 1915.** [The Results of Compulsory Vaccination and Revaccination in East Java during the Years 1912 to 1915 inclusive.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1916. Vol. 56. No. 7. pp. 1029–1058. With 3 figs.

A table facing page 1,054 of this paper shows that, as the result of compulsory vaccination in the medical administrative district of East Java, the incidence of smallpox was reduced as follows :—

Number of cases per million of population.					
1912	..	350	1914	..	55
1913	..	470	1915	..	5

that is to say, the disease was practically suppressed. The major part of the paper is taken up with statistical details of no general interest.

J. B. N.

BUSSIÈRE (Fr.). **Le coup de froid chez les tropicaux ; ses conséquences pathologiques.**—*Ann. d'Hyg. Publique et de Méd. Légale.* 1917. Jan. 4 Ser. Vol. 27. pp. 29–34.

The expression " coup de froid " is suggested by " coup de chaleur " or heat stroke, and signifies the action of cold on tropical natives, not protected by heredity or acclimatisation, brought straight to temperate climates. There result either acute attacks of malaria, liver infection or, above all, infection of the lungs and bronchi. Pneumococcus infections are the most frequent and severe [see above, p. 226]. The present paper deals only with one clinical manifestation—albuminuria. The author was responsible for the hygiene of a camp at Frejus-Saint-Raphael and for the hospital at Galliéni, the latter containing Senegalese. Here the urine was examined on admission in every instance. In the case of pneumonia albuminuria was invariable ; of 158 patients all had it. Twelve, or 7·5 per cent., died. There was polyuria and casts, never blood. The albumin appeared with the pain in the side, and lasted as long as the pneumonia. Both obviously had the same causes : " coup de froid " and infection by the pneumococcus. The 12 autopsies showed that the pneumococcus was always present in smears of the renal parenchyma, and that the kidneys were large, red, congested, with non-adherent capsule ; the weight was 300–400 gms. All the patients were then examined, with the result that 20 per cent. of those confined to bed showed albuminuria. This albuminuria is not as a rule persistent : it yields to treatment in 1–3 weeks ; but in some instances uremia followed. As for prevention, it is pointed out that the barracks must be well protected against cold and warmed if necessary. Black soldiers should be clothed more warmly than white, with several garments in addition to woollen underclothes. A flannel band which can be wound 5–6 times round the body from armpits to pelvis is especially useful.

A. G. B.

FOUREST. **L'héliothérapie à l'Hôpital militaire du Belvédère, à Tunis.** —*Caducée.* 1917. Oct. 15. Vol. 17. No. 10. pp. 134–136. With 2 figs.

The author has studied the effect of exposure to the sun in cases of tubercular lesions of bones in wounded soldiers, especially Serbians. Details of 10 such cases are given. In 3 cases of severe diffuse cellulitis, 8 of fistula in ano, and 2 of testicular tuberculosis (details furnished), the method yielded excellent results. He noted also its good effects on skin grafts, and believes that in the future it will be extensively used, especially in North Africa where the sun always shines.

A. G. B.

TALBOT (A.). **Clinique ophtalmologique d'Hanoi en 1916.**—*Bull. Soc. Méd.-Chirurg. de l'Indochine.* 1917. June. Vol. 8. No. 1. pp. 22–25.

A statistical table giving the new and old attendances for all eye diseases and for trachoma from April, when the Clinic was founded, to the end of 1916 shows that of 2,689 admissions 2,272 were for trachoma, and that of 374 operations 318 were for trachoma and its sequelae. The disease has been known in Tonkin since 1910. The author proposes the organisation of travelling brigades, managed by natives trained in diagnosis and treatment of trachoma. They would treat all cases and educate the people in preventive methods.

A. G. B.

WAKISAKA (F.). [**Investigation of the Relationships of those suffering from Trachoma in a Fishing Village.**]—*Nippon Gankwagakkai Zasshi.* (*Jl. Japan Ophthal. Soc.*). 1917. Feb. 28. Vol. 21. No. 2. pp. 134–157.

[From Review by R. G. MILLS.]

The author noticed that a great number of the members of some families suffered from this disease and that in others there were few cases or none at all. Some seemed very susceptible and others were apparently quite resistant. This tendency to or freedom from the disease was apparently hereditary, being transmitted from parent to offspring and in case of intermarriage the mother's influence predominated in 80 per cent. It was noted that most of those mothers who brought a tendency to the disease with them into a family otherwise resistant were those who had come from a distance and had not been raised in that community. It seems to be a custom where practicable to secure the young wife for a boy in the vicinity and this fact has made it quite easy to trace the relationship for three or four generations back. For convenience those are called " trachoma families " who have a decided weakness toward the disease and those are " non-trachoma families " who are resistant towards it. In all, 94 families (61 main families and 33 branch families) were traced out and of these 53 were found to have been allied by intermarriage during the last four generations. Twenty-one were definitely trachoma families and 32 were not, leaving 41 uncertain or mixed. Of the 32 originally non-trachoma families 8 had never had a trachoma patient in them, whereas the remainder were gradually tending to become more susceptible through intermarriage. The prevalence of the disease can be imagined from the fact that in

11 families comprising 63 persons there were 44 affected. In another series of 42 persons every one was affected. Women are more commonly affected than men but the disease is less severe in them. In the male line of descent the disease tends to die out but in the female line it is more often perpetuated unless by the constant intermingling with non-trachoma family blood. The number of persons affected in the village is greater relatively now than it was 50 years ago but the severity is less, continuing to remain so as long as no woman with a tendency to trachoma is brought in from the outside.

A. G. B.

ANDERSON (Harry Warren). **Yeast-Like Fungi of the Human Intestinal Tract.**—*Jl. Infect. Dis.* 1917. Oct. Vol. 21. No. 4. pp. 341–385. With 6 plates & 1 text-fig.

This article, from the Department of Plant Pathology of the University of Illinois, is an important one and will be consulted by specially interested workers. After a historical review with numerous references the author describes his methods. He isolated yeasts from 85 samples obtained from 175 persons; 31 were "diarrheal" cases, 18 were pellagra, and 1 sprue. The results of the morphologic, physiologic and cultural studies of the organism isolated are given; 27 fungi were studied. The classification of the budding fungi is discussed and a key to the genera is furnished. Several new species of yeasts are described. The summary is, in part, as follows :—

"Yeast-like fungi are commonly found in the intestinal tract of man. They are of many species and, for the most part, such types as are commonly present in nature and known as 'wild yeasts.' It is probable that these yeasts are ingested with the food.

"The feces of persons suffering from gastro-intestinal disorders of various types do not yield a larger number of yeasts than those from healthy persons. There is no one species commonly present in the intestinal tract of either healthy persons or those suffering from gastro-intestinal troubles.

"In a case diagnosed by highly competent clinicians as sprue, yeast-like organisms of a single species and in great numbers were constantly present. This species is the same as the sprue organism isolated by Ashford.

"Non-pathogenic yeasts, when fed in mass, pass through the alimentary tract in a living condition and may be found in great numbers in the feces. They do not cause serious inconvenience when fed alone, and are not retained longer than the ingested food.

"The sprue organism, when ingested after being in culture for several months, is not able to cause the disease but is retained in the intestinal tract for a longer time than in the case of the non-pathogenic forms.

"The pathogenic yeasts, for the most part, are easily distinguished from the yeast-like fungi isolated from the digestive tract. None of the yeasts isolated from healthy persons or from those suffering temporary intestinal disturbances were identical with the pathogenic yeasts studied. . . .

"The yeast-like fungus associated with sprue is similar in many of its characters to *Endomyces albicans* and is possibly identical with the yeast commonly found causing thrush in children.

"The sprue organism (*Parasaccharomyces Ashfordi* sp. nov.) is easily distinguished from the 'wild yeasts' commonly found in the intestinal tract by its reactions in sugar mediums and milk; and cultural characters, such as the peculiar growth in gelatin-tab cultures and the formation of septate mycelium in gelatin hanging-drop cultures. No one of these characters when taken alone is sufficient to identify the species and any or all of them vary under some conditions."

A list of about 90 references follows. A. G. B.

WILLCOX (W. H.). **Rations in Relation to Disease in Mesopotamia.**—*Lancet.* 1917. Nov. 3. p. 677.

This is the abstract of a lecture delivered before the Amara Clinical Society. Whereas the British ration in Mesopotamia is in all respects adequate, provided that transport is free and the ration is not deteriorated by intense heat, the Indian ration shows a large excess of carbohydrate. The Indian gets 10½ lb. of atta or rice per week. Scurvy was prevalent among the Indians especially in the hot weather owing to their disposition to this disease, reduction in the supply of vegetables and the dislike of some of them to fresh meat. Of articles in the ration sour limes, potatoes, onions, spinach and fresh fruit have all a high anti-scorbutic value, tinned fruits and dried vegetables little or none. To fresh sour limes and raw potato chief value is assigned; the potatoes are cut into small slices and eaten with onion and vinegar. Beriberi occurred in British troops but not in Indians. The British flour had been deprived of the aleurone layer and germ of the grain; the atta contained both. Bread made of a mixture of atta and British flour is very palatable and protective against beriberi. An extract of yeast was served out to the troops and [post or propter] in the following season there was little beriberi.

A. G. B.

BRUCE (David). **Camping in the Tropics.**—*Trans. Soc. Trop. Med. & Hyg.* 1917. July. Vol. 10. No. 8. pp. 199–206. With 6 figs.

The greater part of these notes deal with the tent and its accessories. Diagrams show how the verandah of the ordinary double-roof ridge tent may be made into a fly-proof room. It is recommended that the mosquito bed net should be adapted to the shape of the tent, i.e., its roof be parallel with the slope of the side, strong hooks being sewn on the seams of the tent. "Another improvement is to make the net into a closed bag by sewing it to a floor or base of calico. . . . Altogether it is the easiest managed, the safest, and the most comfortable net for a camp bedstead." [The reviewer, who used such a net for six years, can confirm this.] The mattress is placed within and the occupant enters through an opening in the side.

Under the heading Protection from tsetse and other biting flies, a useful headpiece is described and figured. It is made with stiff native string by means of knitting needles one-third of an inch in thickness, covers the head and part of the face and extends well down on the chest and back. It is like chain-mail and well-ventilated. The interstices, through which a tsetse could creep, are closed by a layer of coarse mosquito netting sewn on the surface. This headpiece is of special value in cycling. Similar fingerless gloves can be made. The paper is a useful one.

A. G. B.

SIMPSON (W. J.). **The Vizor Antimosquito and Fly-Proof Headgear. Invented by** Mrs. W. J. SIMPSON.—*Trans. Soc. Trop. Med. & Hyg.* 1917. June. Vol. 10. No. 7. p. 140. With 1 plate.

This fly-proof vizor "is worn underneath the hat or helmet or alone, and is designed for sleeping in when the hat or helmet is taken off."

It can be folded in small compass. Its construction is seen in a photograph and it is procurable through the Army and Navy Stores.

A. G. B.

VAN DEN BRANDEN (F.). **La roussette,** *Cynonycteris straminea,* **animal de Laboratoire.**—*Bull. Soc. Path. Exot.* 1917. Oct. Vol. 10. No. 8. pp. 731–732.

The author draws attention to the large fruit-eating bat, *Cynonycteris straminea,* as a useful laboratory animal in Tropical Africa. It is found in considerable numbers in forest galleries in the Congo and lives well in cages on fruits, such as bananas and papays. It is susceptible to *T. gambiense* infection as RODHAIN has recently shown [see this *Bulletin,* Vol. 8, p. 272], and may well be a reservoir of the virus of sleeping sickness.

A. G. B.

BLAU. **Die planmässige Insektenbekämpfung bei den Russen.** [The Campaign against Insects in Russia.]—*Ztschr. f. Hyg. u. Infektionskr.* 1917. May 3. Vol. 83. No. 3. pp. 343–382.

This communication corresponds only in part to its title. It contains a superficial account of similar work in Germany and elsewhere and need not be abstracted in any detail. The section headed The Role of Insects in the Spread of Infectious Disease is incomplete and not always accurate. In that headed Methods of Insect Extermination many measures against body lice are mentioned without any evidence whether they are really effective. In view of the use of shirts impregnated with chemical substances, as recently recommended [see this *Bulletin,* Vol. 9, p. 103, and Vol. 10, p. 243], it is interesting to note that the Cossacks and people of Little Russia use shirts dipped in tar or pitch and that in the Russo-Turkish War of 1827 such shirts were believed to protect against plague and typhus. In the Russian army now the "washing" is impregnated with 10 per cent. tar solution, with what success is not yet known. The Carpathian herdsmen are said to dip their linen in melted butter, which is supposed to act mechanically by preventing the deposit of louse eggs upon it.

Some figures are given of the comparative incidence of malaria in the Russian and other armies; it appears that in 1911 in the Russian army there were 27,000 cases. The reasons for the prevalence of malaria on the Russo-German front are discussed in some detail; they are said to be the great extent of swamps, the lowness of the houses and the want of cellarage, owing to which the mosquitoes hibernate in the thatch of roofs from which they cannot easily be dislodged.

In an appendix will be found recipes and methods of the preparation of various means of "Disinsection." A mixture of turpentine, insect powder, kerosine and carbolic acid of complicated preparation seems to be largely used in Russia; it is known as Malanin's solution and is sprayed in buildings; its advocates claim that it kills mosquitoes, flies, bugs and fleas.

A. G. B.

NUTTALL (George H. F.). i. **Bibliography of Pediculus and Phthirus, including Zoological and Medical Publications dealing with Human Lice, their Anatomy, Biology, Relation to Disease, etc., and Prophylactic Measures directed against them.**—*Parasitology.* 1917. Nov. Vol. 10. No. 1. pp. 1–42.

ii. **The Part played by *Pediculus humanus* in the Causation of Disease.** —*Ibid.* pp. 43–79. With 1 plate.

iii. **The Biology of *Pediculus humanus*.**—*Ibid.* pp. 80–185. With 2 plates & 12 text-figs.

i. The scope of the bibliography is described in the title; 639 publications are enumerated. "Reference to the really old literature has been omitted."

ii. This paper relates chiefly to typhus fever (14 pages) and relapsing fever (8 pages). As the facts are by no means well known and the account here given may be regarded as authoritative, the summary of this portion is reproduced in the sections dealing with those two diseases.

iii. It is not possible to summarise this paper, which deals with the prevalence and modes of dissemination of *Pediculus humanus* and its special biology, and contains an account of the original and ingenious methods used by the author. A summary of the work of others is given under each sub-heading and then an account of the author's own experiments. The paper will be found very interesting and is of special value to those who have to control typhus or louse-transmitted relapsing fever.

A. G. B.

FOREMAN (F. W.) & GRAHAM-SMITH (G. S.). **Investigations on the Prevention of Nuisances arising from Flies and Putrefaction.**—*Jl. Hygiene.* 1917. Oct. Vol. 16. No. 2. pp. 109–224. With 5 plates, 4 text-figs. & 3 charts.

This monograph completes a number of the *Journal of Hygiene.* After a section headed Preliminary investigations, on the destruction of adult flies, eggs and larvae, some fifty pages are occupied by an account of investigations on Putrefaction. Then follows a section on experiments on maggots and exposed carcases, while the last section is on the Control of nuisances due to flies and putrefaction, especially such as arise in Public Health practice or in war. From the conclusions of this section the following are extracts :—

"6. Manure should be treated by spraying with creosote oil at the earliest opportunity. If made into heaps each incremental addition should be spread uniformly on the heap and sprayed at the rate of at least 100 cc. per horse per day. The manure does not seem to be injured by this treatment.

"8. The chief objections to the use of creosote oil for such purposes are (a) its irritant action on the skin and mucous membranes, (b) its inflammability and (c) difficulties in transport. In view of the excellent results obtained the objections are of little importance. In our experience its irritant action on the skin is very slight, and the eyes can be protected by the use of glasses when spraying; its inflammability is low except when used as a spray, and suitable precautions could be easily employed. The difficulty and cost of transport have to be weighed against the economy in labour, since a single treatment with creosote oil is more efficient than many with 5 per cent. emulsions of disinfectants."

The General Summary is reproduced with the exception of that part which treats of the nature of putrefaction.

"1. Flies may be killed either by poisons (a) absorbed from the alimentary tract, or (b) acting through the respiratory system. They are very resistant to many alimentary poisons which possess considerable toxicity to animals, but are more susceptible to respiratory poisons.

"2. As very little difference could be made to the general fly population by killing adults alone we have not persisted with experiments designed for this purpose. Aniline is the most suitable of the reagents, not dangerous to man, used in the way suggested, which we have tested.

"3. Flies are most easily and effectually destroyed by attacking them in their immature stages as eggs or larvae.

"4. The eggs of species likely to be dangerous to man by conveying infected material to his food are laid on (a) exposed animal matter, (b) manure, and (c) refuse.

"The eggs and maggots in these situations may be considered to represent large numbers of flies in traps.

"5. For killing eggs or larvae in their breeding grounds we have found coal-tar oils, especially creosote oil, to be the most satisfactory reagents. Aniline emulsions are useful, but have little effect on putrefactive processes and the nuisances due to them.

"6. Flies may be repelled from substances which attract them, such as decaying bodies, faecal material, etc., and kept out of habitations by means of the repellent constituents of coal-tar oils.

"7. Flies sprayed with these oils are killed.

"14. In the superficial treatment of intact or opened carcases and other putrescible materials reagents should be used which adhere to the greasy surfaces, form films, render the skin waterproof and kill the bacteria in it, thus checking putrefaction by preventing the access of water and putrefactive bacteria to the tissues. Further the reagent should be capable of eliminating any stenches which may arise, repelling flies, killing the eggs or larvae, resisting the action of water and remaining operative in all respects for a long period.

"15. Watery emulsions of disinfectants are necessarily deficient in most of these properties. Undiluted oily reagents only possess them.

"16. By superficial treatment combined with injection of certain reagents into the blood vessels exposed carcases may be preserved for months.

"17. The burial of carcases does not prevent the development of larvae present on them, or the subsequent emergence of the flies.

"18. In our experience the reagent, which possesses the required properties to the greatest extent, and gives the most satisfactory results in practice and is sufficiently cheap and easily obtained for use on a large scale, is coal-tar creosote oil of 'country make.'

"19. For general purposes, especially when the repelling of flies is of importance, we recommend the use of coal-tar creosote oil of country make, containing a high percentage of phenolic bodies, to which sufficient bases, extracted from 'light oil,' are added to make the proportion of bases to phenolic bodies approximately one to two."

A. G. B.

HILL (Gerald F.). **A Report on some Culicidae of the Northern Territory.**—*Bull. Northern Territory of Australia.* 1917. Jan. No. 17. 8 pp. With 16 plates & 1 map. Melbourne: Albert J. Mullett. Government Printer.

This Bulletin gives the results of 3½ years work. The author collected 26 species which are named, and 6 which remain to be determined. Notes of distribution and habits are given. *Nyssorhynchus annulipes* Walker, which seems to be the carrier of malaria in that part of the world, is widely distributed, "somewhat scarce near the littoral and fairly abundant in certain inland localities." Nine such are given.

The larvae are generally found in stagnant pools and hence are more prevalent in the dry season than in the rains. It is nocturnal as well as diurnal and in open country near pools attacks man for an hour or two before sunset. The larvae are not uncommon at Darwin, but few reach the adult stage owing, it is believed, to predaceous insects; owing to the scarcity of imagos malaria has seldom, if ever, arisen *de novo* at Darwin. *Culex fatigans* is very troublesome at Darwin. *Stegomyia fasciata* is well established on the coast and is being spread inland by the railway. With the former it is often seen in the carriage lavatories. The breeding habits are the same as elsewhere and do not need repetition. During an epidemic of dengue in 1914 at Darwin *S. fasciata* was extremely numerous. Photographs show the breeding places of several species and a map is appended.

A. G. B.

MACFIE (J. W. Scott). **The Identifications of Insects collected at Accra during the Year 1916, and other Entomological Notes.**—*Report of the Accra Laboratory for the Year 1916.* 1917. London: J. & A. Churchill. pp. 67–75. With 3 plates, 3 text-figs. & 1 map.

A map is given showing the distribution of *Stegomyia fasciata* in the Gold Coast, as far as at present known; it is noted that the entries are surprisingly few. A list is furnished of the insects collected at Accra during 1916, exclusive of those enumerated in the Report for 1915; 14 names have been added to the list of mosquitoes, making 55 in all; some typical breeding places are shown in photographs. Interesting notes follow on the natural foes of mosquito larvae. Among these were a Notonecta, the larvae of water beetles, a small crab and a voracious fish found in a pool which seemed an ideal haunt for larvae but contained none. The gregarine *Lankesteria culicis* Ross (figured) was found in three samples of *S. fasciata* larvae out of 11; it is believed to have no ill effect on the development. Of 33 house-flies collected in butchers' stalls 14 were infected, many heavily, with *Herpetomonas muscae domesticae.* A specimen of *Cordylobia rodhaini* was bred from a larva found in the forearm of a native.

A. G. B.

PITTALUGA (G.) & DE BUEN (S.). **Nota sobre los dipteros del género "Phlebotomus" en España.** [Note on the Diptera of the Genus Phlebotomus in Spain.]—*Bol. Inst. Nac. Higiene de Alfonso XIII.* 1917. June 30. Vol. 13. No. 50. pp. 137–145. With 3 plates.

Of the five European species of Phlebotomus the authors have found three in Spain and its dependencies as follows:—

P. papatasii in Malaga and Palma de Mallorca.
P. minutus in Malaga, Palma de Mallorca and Granada.
P. legeri in Malaga and Palma de Mallorca.

The first and last also in Spanish Guinea.

From the blood and liver of geckos (*Platydactylus mauritanicus*) the authors have been able to cultivate forms of *Leptomonas* identical with those found in Oriental sore, from which fact they think it probable that the gecko may serve as a reservoir for the parasite of Leishmaniasis. The gecko exists in all the localities in Spain in which Phlebotomus has been recognized.

J. B. N.

TAKATSUKI. **An Essential Property of Petroleum for Mosquitoe Control.** [Japanese Text.]—*Kyoto Igaku Zassi.* 1917. Nov. Vol. 14. No. 7. [Author's Summary p. 84.]

The author says that "the cause of death [of the mosquitoes] is not a simple mechanical suffocation that will occur when the breathing pores are stopped." It is suggested that the surface of the breathing siphons and respiratory apparatus is covered with an epithelial membrane which has a "special chemical affinity with petroleum"; the membrane is easily stained with petroleum solutions of dyes but not with watery solutions. Hence it is not necessary to cover the ~~whole~~ surface of the water with a petroleum; 26 cc. of kerosene to every square metre was found "sufficient to destroy almost all larvae and pupae during the summer time." The larvae and pupae of the late autumn were more resistant. [On the subject of kerosene as a larvicide cf. MACFIE, this *Bulletin*, Vol. 9, p. 367.]

A. G. B.

Book Review.

Daniels (C. W.) [M.B., F.R.C.P.] & Newham (H. B.) [M.D., M.R.C.P., M.R.C.S., D.P.H., D.T.M. & H.]. **Laboratory Studies in Tropical Medicine.**—xv + 560 pp. With 6 coloured plates, 164 figs. & 7 charts. Fourth Edition. Thoroughly revised, with new and additional illustrations. 1918. London: John Bale, Sons & Danielsson, Ltd. [Price 21*s.* net.]

We may express firstly our opinion of this book that it is inconveniently arranged, that its matter is diffusely presented, that much of it is of too elementary a character to be of practical value, or if we take it for granted that the information is intended for the beginner, that he will often not understand it, that on several important subjects no information is afforded, and that erroneous matter is not inconsiderable. We shall endeavour to give reasonable grounds for holding this opinion. As regards arrangement we find for example micrometer scales and measurements described on pp. 13–15 and again pp. 456–457. On pp. 28 *et seq.* we find six or seven fixatives given, but sublimate alcohol is not mentioned, though if our memory is correct it occurs somewhere in the book but as it is not given in the index we have been unable to find it again. In this chapter (II) on fixation and embedding the time given as necessary for passing a tissue through paraffin is 7 days, whereas the process can readily be done in 7 hours if needs be. The time for the fixation of a blood film (p. 51) is given as 10 minutes or more whereas anyone can convince himself that 10 seconds or less is sufficient. Again the staining of a cestode proglottis (p. 360) occupies some months, whereas "overnight" is all the time that is required to give specimens showing everything possible in a "total preparation." We find however on p. 499 (and this illustrates the inconvenience of arrangement) another method for staining cestodes, but as given it apparently applies to live cestodes only.

We all agree that a knowledge of normal blood is necessary for the student of pathological blood. On p. 69 we find the remarkable statement that lymphocytes contain no granules (chromidia or "azurophil" granules) in their cytoplasm, whereas large mononuclear leucocytes (normocytes) do; the granules in these latter being coarse or fine. If the authors arbitrarily define lymphocytes in this way, they stand so far as we know alone, as a reference to the text books of haematology will show. The matter is of importance in connection with the large mononuclear count in malaria, etc., because counts made on this basis will differ enormously from those of observers who follow other criteria in defining lymphocytes and monocytes. Nor do we think that the authors can have made many relative counts in the way they recommend, viz.: "the edges of the film where leucocytes are most numerous should not be included in the enumeration." In addition to the great labour and strain involved in such a method of counting, owing to the scarcity of leucocytes in the parts away from the edges, we have reason to believe that the method will give erroneous results. A comparison of Plate V, figs. 3–13, with a well stained blood film must convince anyone that these figures are inadequate and indeed erroneous representations of the characteristics of various leucocytes, more especially in the case of the myelocytes. We find no reference to the Arneth count. On p. 49 pictures are given of the making of films, but we think the fact should have been pointed out that there is no real advantage in pushing over pulling the blood drop. Our experience is that precipitate is *not* avoided by inverting the slide in the stain; it is the length of time of staining and the brand of stain that are the factors. The great dangers, owing to the débris present, of "thick films" for the inexperienced are not sufficiently emphasized, and we frequently prefer to examine thick films with the haemoglobin *undissolved* for with some practice parasites are, if present, readily seen. Acetic-alcohol is preferable to water as a solvent of haemoglobin for it is a delicate fixative and the resulting film is far cleaner and the staining is equally good. We find no mention among the "deceptions," p. 98–101, of "Cabot's rings," a very common feature in certain blood

films, nor of "falciform bodies," nor of leucocyte fragments—spherical pieces of leucocyte cytoplasm deeper stained at the periphery than in the centre, most puzzling to the novice, nor yet of "anaplasmata," "paraplasmata," "centrosomes," etc., all of importance, for they are appearances commonly met with and which the student must be made aware of. In regard to thick films used in detecting filarial embryos, on p. 132 it is said, "when quite dry place in water." It should have been explained what the authors mean by "quite dry." If an ordinary thick film apparently "quite dry" is placed straight away in water, disaster will ensue only too often, i.e., the film will entirely disappear, or flake off, but if kept over night or for some hours (? in an incubator) till "really quite dry" then they may be safely treated. The successful staining of filarial embryos with haematein depends in our experience not on *warming* the stain, but on actually bringing it to the boil.

The description of the piroplasmata (p. 104) and that of the trypanosomes (p. 114) are very inadequate outlines of the matter. All the information given about *P. bigeminum* is the fig. 24, Pl. IV, which is not characteristic, and figs. 25–27 are vaguely termed sporozoa in cattle. As none of the piroplasmata are pathogenic to man, this may be considered adequate, yet the trypanosomes hardly receive more detailed description. It is not even stated that *T. gambiense* has long and short forms, the figure given being that of a long form. *T. uniforme* and the widespread *T. vivax* are not mentioned though other animal trypanosomes are. It is said that much reliance cannot be placed on inoculation experiments as a means of differentiation of species, but the dangers of graphs of lengths of trypanosomes are also great though not pointed out. The classification of Leishman-Donovan bodies as a parasite found in blood plasma is peculiar. The term Leishman-Donovan body (an antique expression) is still used without any reference to specific names and we find no mention of Leishmaniasis in children or in dogs or of the nasopharyngeal forms.

On p. 382 we find it stated that of protozoa found in the stools *Amoeba coli* "is of the most importance." On p. 384 "the *Entamoeba coli* (*A. coli*) is now generally held to be non-pathogenic." The description of the amoebae and indeed of other organisms in the stools is poor and the illustration of *A. coli* (Plate VI) is, to say the least, peculiar. In chapter VII the statement that various nematode worms in horses and other animals cause "verminous aneurisms," conveys practically no information; also that the adults of the human filaria are found in various parts of the body is vague. The researches of the last six years or so on the structure of filarial embryos are not given, and the fact that much can be made out by Romanowsky stain which is not shown by haematoxylin. "Very dilute solution of stain," "well diluted haematoxylin," are hardly precise enough directions for the inexperienced. We have not found any reference to Bahr's observations on the mode of entry into the body of the embryos. We have had no experience of microscopic examinations of blood for bacteria but on general grounds we should consider it waste of time, as certainty can only be obtained by other means, and not always without difficulty.

As another example of inconvenience in arrangement, *F. loa* is mentioned in this Chapter VII, but its alleged conveyance by *Chrysops* occurs in Chapter XIII. No hint is given of the existence of the genera *Loa* and *Acanthocheilonema*. In Chapter XXI we meet *Filaria bancrofti* again in connection with chyluria. As regards the latter practically nothing is said and information on the important question of "fats" in chyle and lymph is wanting. It is not correct to say that haemoglobinuric urine is clear, because "haemoglobin" casts are of course present when passed.

We find the bacteriology of plague and dysentery are omitted, nor do we find the bacilli mentioned in the index. *Streptothrix madurae* is the only organism of Madura foot mentioned, a defect which leaves the student stranded just when he would be glad of help in a difficult subject. On p. 574 we find the extraordinary and totally erroneous statement that it is best to examine nematodes unstained and describe them as they appear in the fresh condition mounted in normal saline. The helpful and extremely rapid method of clearing in carbolic acid is not mentioned. The description

of the Nematodes appears to us inadequate; e.g., the illustration of the head of *N. americanus* only bears a faint resemblance to reality and the margins of the dorsal cleft of *A. duodenale* are so exaggerated that they resemble teeth. The other two figures on the page are of no practical value.

The genera *Fascioletta* and *Cladorchis* still appear among the Trematoda though it is many years since it has been shewn that the species concerned do not belong to these genera. The spermatheca and Laurer's canal are mentioned on p. 365 but are not shown in the schematic Fig. 146. The pages (5½) dealing with the Cestoda open abruptly with hydatid cysts, but no explanation is given of their development, a matter on which the student very frequently has no clear idea. As important as the hooklets in the cysts and more readily found is "hydatid sand" consisting of brood capsules and scolices. The presence of *Cysticercus cellulosae* in man is not mentioned.

The index is poor; e.g., neither under *Glossina* nor under Tsetse-fly do we find a reference to p. 202, where a table of species is given, but only 9 of the 16 known species are mentioned and nothing is said of the important characters of the genitalia. In this and in many other cases there is an absence of real revision. So that we do not consider the authors have been successful in their endeavour "by judicious revisions and additions to as far as possible bring the book up to date" (Jan. 1918) and as a detail it may be pointed out that the book was published in 1917 although it bears the date 1918.

Our opinion is that this book contains much elementary matter which is better conveyed and indeed only effectively so by personal teaching in a laboratory. Of more advanced matter which the student thus taught could himself assimilate, the book contains too little. The best portions are we think those dealing with bacteriological technique and chemical analysis.

J. W. W. Stephens.

We much regret to record the death of Dr. F. M. Sandwith, C.M.G. Dr. Sandwith became Sectional Editor for Pellagra in 1912, and, as readers are aware, treated the perplexing literature of that subject in a most efficient as well as agreeable manner.